Gleanings in Bee Culture

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EDITORIAL

By E. R. ROOT

NEW DRESS OF TYPE.

THE reader will notice the new dress of type. Our big subscription list, entailing heavy runs on the type, wears our faces much faster than formerly. While a thousand dollars' worth of type would formerly give us some two or three years of service on our journal, the same investment will run now scarcely a year.

FAKES AND FAKIRS.

THE bee-keeping industry does not seem to be cursed with a lot of fakirs as is the case with the poultry industry. The bee business has fewer and better journals, and of a character that will not accept fake advertisements. The time was, in the olden days, when there were advertised moth-traps, bee-balm for drawing swarms, worthless patent hives, certain controllable bee-hives, and the selling of patent-right territory. These have all disappeared; but as one looks over the poultry journals of to-day he sees the devices for testing eggs, testing the sex of eggs, and a lot more things of a like nature that are fakes of the worst kind. Pick up any of our bee journals and you will find only straight honest goods advertised.

FOUL-BROOD LEGISLATION IN MASSACHUSETTS.

ON March 25 the House of Representatives of Massachusetts passed an act having to do with the suppression and control of contagious bee diseases, and the matter is now in the hands of the Senate. It would be well for all interested to write to their Senators at once, urging their favorable consideration of the bill.

The proposed bill provides for the appointment, by the State Board of Agriculture, of a competent person as inspector of apiaries, who may in turn appoint as many as three deputies to assist him. The inspector's duties include the preparation and distribution of literature, inspection of apiaries, etc. Sections 3 and 4 make it an offense to keep diseased colonies except by an order in writing from the inspector that such are held in quarantine. Section 9 provides for an expenditure of a sum not exceeding $500 during the present fiscal year in carrying out the provisions of the act.

NO FLOOD OF HONEY FROM SOUTHERN CALIFORNIA THIS YEAR.

THE following letter just received from J. W. George, who is in close touch with the situation, will explain.

From present indications California will not flood the country with honey this year. What earlier looked like a bumper crop in the coast counties looks very discouraging now. My bees are fully a month behind what they were a year ago; and our cold April winds have commenced to blow, and that will retard them a good deal.

There have been several carloads of bees shipped into the valley this winter; but with one exception our two-mile-limit rule has been observed, and it is more than likely that the man who has disregarded the custom will be sorry of his bargain before the summer is over. The man who is being crowded owns and controls about 1400 colonies, and he will certainly keep up his end; besides, he has the sympathy of every bee-man in the valley.

There is another problem confronting us now. Black brood was quite prevalent in the San Joaquin Valley last season, almost wiping out some yards. But the supervisors of this county are awake to the interests of the valley, and at their meeting the first of this month they passed an ordinance compelling all bees to be inspected at Imperial Junction; and as that is the only way for them to get into the valley we stand a pretty good chance of keeping it out; however, it will be well for every one to be on the watch, and at the slightest indication of any thing wrong the inspector should be called in.

Practically all of our last year's crop is out of the way. I think a hundred cases is about all that is on hand at present.

Imperial, Cal., March 28. J. W. GEORGE.

It is strange that the season seems to be late in that section of the country, while it is at least a month ahead in the Eastern States.

Later.—March 31st Mr. Mercer writes:

A few days ago we had 1½ inches of rain. This will help us some, but not enough to make any thing like a crop of honey.

Ventura, Cal., Mar. 31.

BEE-KEEPING ON A LARGER SCALE; TEN-FRAME VS. EIGHT-FRAME HIVES; POWER EXTRACTING-OUTFITS.

THERE are many evidences from bee-supply houses that show that the tendencies now are toward ten-frame rather than eight-frame hives, and large four, six, and eight-frame extractors rather than two-frame machines. When the power-extractor outfits were first put out it was not thought that there would be much of a demand for them; but in the West, where bee-keeping is carried on in any kind of large scale, power outfits are more and more supplanting hand-power extracting.

The time was when the eight-frame Langstroth hives took the lead. While they still occupy a very prominent place in the supply houses, the ten-frame hives are gaining ground every day. From some experiments that we have been conducting at one of our outyards, the ten-frame outfits seem to be in the lead, not only in wintering, but for honey. Father Langstroth figured out very carefully this brood-nest; and while a cubical brood-nest is theoretically correct, perhaps the dimensions that he gave us are more nearly right from a practical standpoint.

The eight-frame Langstroth hive came into existence because it was supposed that the ten-frame was too large for the production of comb honey. Later experience shows that, if there is to be any reduction in the size of hive-bodies or brood-chambers it should be along *vertical* rather than lateral lines; hence we see a strong tendency growing more and more toward the ten-frame hives, shallower than Langstroth, otherwise the same dimensions, especially shallow extracting-supers.

As we have said before in these columns, where one runs for extracted, the ten-frame is much to be preferred; and even if he wishes to confine himself to the production of comb honey, it is doubtful if he would gain any thing by adopting the eight-frame width.

The tendency all along seems toward a standardization of supers, covers, and bottoms as well as hive-stands, for there is nothing more annoying than to have two widths of hives in a yard, or different yards, one with eight-frame and the other with ten-frame size. As the latter seems to show a little the advantage in the production of extracted honey, and is probably nowise inferior for the production of comb, it is not at all surprising that the whole bee-keeping public seems to be turning more and more toward the ten-frame width of hive.

THE REMARKABLY EARLY SPRING IN THE EASTERN STATES; EXCELLENT WINTERING AND SPRINGING OF THE BEES.

FORTUNATE indeed it was that bee-keepers in most of our Northern States have had and are having a very early spring. Settled warm weather came on in many localities along about the first of March—something that was very unusual. A year ago at Medina we did not have really good bee weather until along toward the first of May, and even after that the weather was cool and unfavorable.

After our very severe winter there probably would have been a good many losses throughout the country had there not been an early spring. As it was, the weather moderated in the nick of time, brood-rearing started, young bees hatched out to take the place of survivors dying off. It follows, therefore, that, even if unfavorable weather should come on, there would be a large force of young bees in most colonies of practically all the northern and eastern States, and to a great extent in the western States. When we say "eastern" States we have in mind territory east of the Mississippi.

Speaking of the spring in general, we have been having an old-fashioned spring, and, we may say, an old-fashioned winter. It is the kind that we remember in our early childhood days, when it was cold all winter and then it merged suddenly into balmy spring. For the last twenty-five years we have been having what are called open winters, many days of which the bees could actually fly when wintered outdoors. This class of winter in our locality would continue on clear up into the first of May, it being neither winter nor spring. Brood-rearing would get started, then get a bad setback by sudden cold that would last a week or ten days. The past winter and spring has been a delightful contrast. We had our winter, with good stiff steady cold, and now we have been having our spring—beautiful balmy days when all nature seems to be giving up praises to God for his goodness.

While it was getting a little dry in some sections, heavy rains came on in the nick of time; the ground is soaked, and the clovers and all plant life seem to be showing up with unusual luxuriance. We never saw a spring when the prospects for fruit-bloom and clover were more favorable, and, according to our prophet, Virgil Weaver (see page 197, March 15), whose prophecy is based on a series of observations made for years back, this should be a *clover* year. He predicted over a year ago that last season would be a failure, and his prediction was almost literally fulfilled for the section of country he outlined.

THE STATEMENT OF A HIGH AUTHORITY IN FRUIT CULTURE ON SPRAYING.

"The American Apple-orchard" is the title of a book by F. A. Waugh, recently published by the Orange Judd Co., of New York. It contains over 200 pages of interesting and valuable matter. Whether one is interested in growing fruit or not, he will find this book very readable. If he is an apple-grower he can not afford not to have it. It reminds us of the time we used to read the Tim Bunker papers, years and years ago. While we were not at all interested in agriculture, yet Tim Bunker's writings were so entrancing that we followed his series of articles as we would follow a serial story.

Well, this F. A. Waugh is a writer a good deal after the same style. We mention his work here because of the author's high standing in fruit culture, and because he advises against spraying trees while in bloom. Those fruit-growers in the vicinity of our bee-keeping friends, who insist on spraying at the wrong time in spite of the advice of experiment stations, all over the United States, and up-to-date fruit-growers, should be shown a copy of this work. If they are so behind the times as to spray while the trees are in bloom they have a lot to learn, and it would be dollars and dollars in their pocket to purchase a copy of this work and

read it carefully. We are not sure but that bee-keepers can afford to buy it and loan it out to their fruit-growing neighbors. For the present, at least, we can not forbear copying a portion of chapter 11, entitled "The Insect Campaign." Under the head of "Codling Moth," the worm that so often turns one's stomach as he bites into an apparently sound apple, he says:

This is one of the best known and most widely distributed enemies of the apple. Newly settled districts have nearly always enjoyed a temporary immunity from this pest, but experience has shown that the moth can not long be kept out of any commercial apple-growing district. Apparently the ravages of the codling moth are more serious in central and southern latitudes, where two or three, or even as many as four, broods are hatched in a year. However, the campaign against this insect is an annual one, and has to be fought in practically all the commercial orchards in the country.

The principal preventive of damage is the spray-pump, using poison sprays. Paris green is largely used at the present time, but is being generally supplanted by lead arsenate. Thorough spraying at the right time with these insecticides will very greatly reduce the percentage of damage. Indeed, in many cases the work of the insect is practically eliminated. As in dealing with every other insect or fungous pest, thorough spraying at the proper time is highly essential. The proper time in this case is within one week to ten days after the falling of the blossoms. A longer delay can not be made with safety. After about 10 days the calyx, or blossom leaves of the young apple, close and the apple turns to a pendant position. Before this time the newly set fruit stands erect with the calyx lobes open. A poison spray properly distributed falls into this calyx cup and the poison lodges there. As many of the young larvæ enter the apple by eating in at this blossom end they secure with their first meal a taste of poison which usually prevents any further apple-eating on their part.

Special attention should be called to the fact that apple-trees should not be sprayed while in blossom. Spraying at this time is not always totally without value, but in many instances it is not only unnecessary, but even highly dangerous to the crop. Under all circumstances it is very likely to poison the bees working on the apple-blossoms. This sort of damage is far-reaching in many cases; and as the bee is one of the fruit-grower's best friends we can not afford to murder whole swarms in this way.

This early spraying, just after the blossoms fall, will not usually catch quite all the codling moth, even all the first brood. When the second or third brood hatches later in the year a still smaller percentage can be poisoned by the arsenical sprays. Nevertheless it pays to give additional sprayings for this purpose in case the second and third broods appear to be large.

Note the special paragraph in italics, which are ours.

The price of the book is $1.00 postpaid. It can be obtained of the publishers, Orange Judd Co., of New York, or of us.

AUTOMOBILES FOR OUTYARD WORK.

QUITE a large number are asking when we are going to give that extended article on automobiles, especially the article describing the machine or machines that will be most suitable for bee-keepers' use.

We have been gathering data from a good many sources, and hope to have ere long an article by which one can make a wise selection of a machine. We have no agency, and no ax to grind, and therefore shall look up machines that have *earned* a reputation for reliability and economy of up-keep, as well as low first cost. For the benefit of some of our readers who can not wait, a preliminary statement should be made. In the mean time the Brush, made by the Brush Runabout Co., of Detroit, costing $485, we believe to be a thoroughly reliable little car. The Reos—one, two, and four cylinder—are all first-class. We have had one and two cylinder machines in operation for the last three or four years. Cost of maintenance of two-cylinder touring-car, capable of carrying five passengers, has been less than $50.00 a year, taking into account adjustment, repairs, and tires. This, of course, did not include gasoline, which will be from 12 to 15 miles per gallon for this type of car. The runabout Reo and the Brush will average, probably, from 20 to 25 miles to the gallon; indeed, the Brush has been known to make even 30 miles on a single gallon. While these $500 cars carry only two passengers, a little wagon-box can be extemporized on the back to carry light freight. The Ford is also an excellent machine for the money. The Brush, Ford, and the Reos are pneumatic-tired outfits.

For all kinds of roads, especially mud, slippery mud, bad sand, we do not know of any thing better than the ungainly looking high-wheeled automobiles, with solid-rubber tires. This type of machine is usually not as well designed or built as those having pneumatic tires; but the one made by the International Harvester Company, of Akron, Ohio, bears an excellent reputation. The particular advantage of high wheels and solid tires is that the cost of tires is a very small item. There are no repairs on the road, no punctures, and these high buggy-wheels will run in mud as well as any common horse-drawn buggy; will not skid nor slip, as we know from some practical demonstrations that we have seen. The pneumatic-tired machines, while they *can* be be made to negotiate mud, are not primarily mud-going machines. Do not let any agent or dealer try to convince you that he has an air-tired auto that will go in mud as easily and with as little danger as a common buggy. The facts are, pneumatic-tired machines slip and skid badly in thin mud, and it is a little dangerous to drive them along roads slanting toward a ditch or an embankment. On the other hand, the self-propelled buggies will negotiate roads slightly muddy about as well as roads that are dry or dusty. For year in and year out we are convinced that, *if well built*, they are coming to stay. They are awkward-looking, to be sure, and are not in keeping with the general styles of the pneumatic-tired low-wheeled machines, nor are they as fast. Unfortunately, quite a number of high-wheeled machines are poorly built and worse designed. Look out for all such, unless you want to pay a big repair bill and keep tinkering on the road. As soon as we can learn what buggy-type machines are reliable we will give a list of them. In the mean time we are safe, we think, in recommending the machine made by the International Harvester Co., of Akron, O. It is made in a large factory that is turning them out by the thousands.

Stray Straws

By DR. C. C. MILLER, Marengo, Ill.

TEXAS ought to be a better honey State than it is with all that bigness shown, page 224.

THE GERMAN bee-keepers' association (Imkerbund) now numbers 90,062 members. —*Leipz. Bztg.*, 30.

AS TO foul-broody bees swarming out when thrown on foundation, doesn't it make a difference which *kind* of foul brood?

DR. BRUENNICH says, although his queens stop laying by August 15, colonies come out strong in spring on account of the bees' *longevity*. He thinks that is ever so much better than a lot of bees reared late to use up pollen stores.—*Schwz. Bztg.*, 60.

IDEAL conditions for taking out bees this year. March 20, soft maples bloomed. At dusk, opened cellar wide. Next morning, 31°, bright and still. Partly shaded cellar window. Quietly set bees on stands, closing entrances to one square inch or less. By noon, 62° with all bees out. Flew gloriously; no mixing; no robbing.

FOUL BROOD utterly destroyed an apiary of 20 colonies. The hives were sold to surrounding bee-keepers, and in every case took the disease with them.—*Schweiz. Bztg.*, 144. [The same thing happens in this country, and only emphasizes the great importance of an effective State law that will stop work of this kind. A bee-keeper who is so ignorant of or indifferent to the rights of others should be held in check by a law that will protect those who are posted or have regard for the rights of others.—ED.]

JOHN H. LOVELL, p. 213, from what you say I suppose I said something about bees and roses not quite on the square, but you don't give page, so I'm left to guess. Perhaps I insisted that bees get nectar from roses. If so, I beg pardon. I don't know that they do, but I do know that they tear the buds to pieces. You say they are "looking for nectar." Don't you think "the mental attributes of the honey-bee are far too high to permit" it to do all that digging when "looking for nectar" where there is none?

ERLE SARGENT, I'd like to answer your seven questions, page 236, but the "boss" doesn't like me to talk "territory." But he may allow me just to whisper to you that, your foundation being wrong, your whole fabric topples. You assume that the man who owns land owns the nectar on it. Not a bit. He can't sell it; can't prosecute any one for stealing it; so he doesn't own it. So there, now. [The discussion of the right to certain bee territory we thought best to close for the present at least. We are no nearer a solution to this much-mooted question than we were twenty-five years ago. If there were as much diversity of opinion among our legislators as there has always been among bee-keepers themselves we could never get a law that would give exclusive territorial rights. There would have to be united action before our legislators, no matter how favorably disposed, would pass a law.—ED.]

I DON'T KNOW enough to know whether it is better to disinfect all foul-broody hives or none; but here's a question: If it's necessary to disinfect a hive, is that enough? If there is danger from a spore on the wall of a hive, is there not danger from one on the stand at the entrance? If so, is there not danger from one on the ground close to the entrance? or further out? Just how far from the entrance does danger end and safety begin? Here's what I suppose the situation here: For every spore left in a hive there are 100 or 1000 of them on the floor at the entrance, and they are still plentier on the ground, thinning off as the distance from the entrance increases; yet for rods the ground is covered with millions upon millions of spores. Is there *no* danger from any one of these if there is danger from one on the wall of the hive? [The entrances and even the alighting-boards should be disinfected just as much as the rest of the hive. Years ago, when we disinfected our hives by scorching, we held the hives with a pitchfork over a bonfire and allowed the flames to strike the alighting-boards at the entrances. A common gasoline torch will do this work very effectively.—ED.]

E. FRANKE made a dozen fertilizing boxes with double glass. He saw a number of queens each return two or three times with mating-signs. The queen was balled for an hour upon returning unless she returned without mating-signs. — *Deutsche Bzuchf.* [This matter of balling queens just returning from a mating trip depends upon conditions. We have just been talking with Mr. Pritchard, who raised 3000 queens last year, and who had abundant opportunity to observe and investigate. Under normal conditions, he says, bees will not ball their queen when they come back to their hive, whether fertilized or not. Sometimes bees will follow after a queen and pull away the filament that hangs to the end of her body. This question was also referred to our Mr. Bain, and he says this balling business depends on conditions. If bees have been allowed to get into a *habit* of robbing they may ball a queen, whether fertilized or not, when she returns from her flight. If a queen, on the other hand, he says, goes beyond the proper mating age for any reason, and fails to meet the drone, the bees may become disgusted and kill her by balling. They, or at least Nature, seems to know that an old virgin will probably not meet a drone, and hence she had better be killed. This principle applies in the case of a colony with a clipped queen that has tried to swarm repeatedly, and on the third or fourth failure to go forth with the queen the bees will probably ball that queen, thinking it is high time to get another.—ED.]

Siftings

By J. E. CRANE, Middlebury, Vt.

Bees appear to have wintered well in this section.

If handling bees on a float shows off to as good advantage as in the picture on page 13 it must pay well.

From W. Mares' experience it would seem that the heat has quite or nearly as much to do with non-granulation as the sun's rays—page 771.

It looks to me as though the steam-heated uncapping-knife is one of the great improvements of the year in the line of extracting honey.

Mr. Holtermann's observations as to the value of bees fertilizing buckwheat-blossoms, page 5, are well worth remembering, as it adds more evidence of the value of bees to rural industries.

Mr. Pouder's reference to paper bottles, on page 19, is of interest. Can Mr. Pouder tell us who manufactures them, east or west? I have had only the address of the owners of the patents who were apparently interested only in the sale of machinery and rights to manufacture. I believe they have a large future for the sale of honey as well as milk.

A good deal is written these days about foul brood. It has been putting in its deadly work for several years in the southwest corner of our Green Mountain State, and it has been recently reported in the northwest and northeast corners. At the annual convention of the Vermont Bee-keepers' Association steps were taken to secure a foul-brood law for this State that will rid us of this scourge before it becomes more general.

On p. 778 Mr. Byer gives interesting facts about the law in Canada in regard to spraying fruit-trees. A kind of spraying other than for fruit-trees came to my attention by some of the Massachusetts bee-keepers, where poisonous mixtures were used to destroy the gipsy and brown-tailed moths. They told me the bees in the vicinity of such spraying were very soon destroyed. Could not a law be enacted that would compel such persons to use carbolic acid or something that would be distasteful to the bees so they would go elsewhere for their water?

Mr. Foster is right in saying that "too much can not be expected of the strawboard case. Several of these came to Denver from a distance of several hundred miles without any marks to show what the contents were." The honey was broken badly. This is as we should expect, and we have always marked such cases so as to show their contents, and tried to get others to do so. If the bee-keeper will not mark his paper cases so as to show whether they contain honey or lead he had better use the wooden cases with glass fronts; but it seems that it is not much protection in the West, for Mr. Foster says, page 6, that the railroads out that way have claims for breakage on a very large percentage of the local shipments of comb honey.

For a score of years bee-keepers' have sought to put comb honey up in small packages; but to make bees work in a small section was, as a rule, to make them fritter away their time and accomplish little, so that it has, so far as I know, never proved a success. On pages 765, 766, Dec. 15, a method is described that has already been proved a success, which the editor modestly describes as "cut comb honey." I believe it would have been perfectly proper to put the head lines in larger capitals. I may be a little enthusiastic; but after reading over this article carefully two or three times I could have thrown my hat twenty feet high, and shouted "Hurrah! hurrah!" Just to think of honey selling at retail for a dollar a pound! Isn't it looking up some? And then to think that the whole business is already so well "Rooted" that no penny-wise and pound-foolish bee-keeper can kill it. A new industry? Yes, and one that is destined to exert a great influence in the use of honey in this country, I believe; for if the dining-cars and big restaurants use it, the smaller hotels and restaurants will soon follow suit, and want little services of comb honey at a lower price; and one person will tell another how fine it is, and thousands will see it used and learn to use it themselves who would not otherwise have ever thought of it. And John Jones, when he comes back from Chicago, will tell his wife what a delicious meal he had on the dining-car, of warm rolls, butter, and honey; and she will inquire of her grocer for comb honey, for some night she will want to surprise John with honey and warm rolls, you know, and so it goes. But, hold a little. We had better not all rush into the new industry; for if we do, while we may not kill it we may hinder its growth. It looks very much as though it were a better industry for the city than the country bee-keeper, and that more careful handling would be required after cutting up than it is likely to get when shipped some distance. Another thing, it would seem as though it should be used pretty soon after it is cut up, as the honey that drips from the comb would granulate and make a rather unattractive-looking service; or does the person who cuts up the comb let the small blocks stand on wire cloth a few hours till dry? [Yes, they are drained.—ED.] We would also do well to remember that there must be some waste from the edges of the comb, and other defects. A pound of honey occupies almost 22 cubic inches of space, or ¼ lb. 5¼ inches.

Bee-keeping in the Southwest

By LOUIS SCHOLL, New Braunfels, Texas

The 1910 census will be an unfortunate one for the bee-keepers' showing. The editorial concerning it on p. 65 coincides with my mention of it, Dec. 15, exactly. As I had stated, Texas' showing will be about half an average crop census. While some States will fare better, others will be even worse off.

A GOOSE FOR A GOOSE.

Hey, Dr. Miller, don't those section-honey facts I gave on page 39 seem to strike you? Perhaps they strike you too hard. Yes, since I read it over in print I found what I had done—struck the section-honey producer a little too hard. And you, trying to get even with me, page 68, call me a goose in a roundabout way. When are *you* going to try some bulk comb honey? No need of your sympathy for our being flooded out, even if you join the Coloradans in a change.

OUR NEW QUEEN-REARING YARD.

Does it pay the honey-producer to rear his own queens? Some of our best apiarists claim it does not, while many others are raising their own queens. To get nearer the truth of the matter an extensive experiment will be made along this line in connection with our work this summer. For years we have purchased our queens, upon the advice of some of our best bee-men, but with more or less unsatisfactory results. Resting on the supposition that our efforts at rearing our own queens can give us no less satisfactory results, if not better ones, we are making the trial.

We believe we can rear our own queens cheaper than we can buy them from some one else; that we can have better queens as a result of our own selection and careful breeding than those generally obtained from the average "rushed-for-queens" queen-raiser; that we shall have better results with queens right from our queen-yard over those that have been subject to several days' rough usage in the mails, and that we can have our queens just when we want them, without waiting for delayed orders, which alone often amounts to severe losses.

With as many as 26 apiaries for honey production we have a splendid opportunity for making a selection of breeding queens from which to raise our new queens. For instance, in one of our apiaries a colony of pure Italians has been the record colony for three years in succession, with only a few others coming up to it, first one season and then another. Such an excellent colony is good enough for a queen-yard, and so we took it there. In this way all the best colonies from each of the various apiaries find their way to the queen-rearing yard. It gives us the best possible from hundreds of good colonies concentrated at one place. This place is an ideal one for the rearing of good queens and perpetuating the good qualities of the cream of our apiaries. Is it not possible thus to obtain some good results?

Of course it takes time to do this work; but I certainly believe that such a branch or department should be kept in connection with any large well-regulated system of apiaries, just as well as other lines of business have their different departments. Then there should be a suitable person in charge of that department. If we count on the superior queens that should be obtained in this way, the money saved that would otherwise go to others for queens, and an increase in our honey crops that must surely result through careful selection and breeding, our efforts should not be wasted.

While we have, from years of selection, some stock as good as may be desired, we by no means expect to stop importing into our yards new blood from some of the leading queen-breeders from time to time, toward still further improving our strains. Together with this we shall always employ the best, latest, and up-to-date methods in queen-rearing, so that our experiments shall not lack in that respect at any time.

A LACK OF SPRING FLOWERS.

In addition to sufficient stores left the bees in the fall for the heavy spring brood-rearing a vast number of native spring flowers have generally been a great aid. But, due to more or less periods of drouth in the fall, winter, and this spring, there are fewer of these flowers this year than we have had for many years.

In consequence of this our colonies that had more stores early in the spring than for a number of years have drawn on these so heavily that many are in need, and have to be given from the heavier ones; and unless our April mesquite flow yields soon it may become necessary to feed.

The ground is covered with bloom in a fair season during April, as shown by the illustration on page 258. This is our State flower, the blue lupine (*Lupinus subcarnosus*), or called "blue bonnet" or "buffalo clover" by many. It grows in great profusion over the entire ground, making it look like a solid blue carpet for miles around. This presents a beautiful sight, and the perfume fills the air, the bees scampering amid the bloom in great numbers.

While the honey yield does not seem to be very great, it aids wonderfully with that from other bloom in building up colonies rapidly just when needed. It yields great quantities of bright yellow, orange, and red colored pollen. This year, however, the ground, usually covered by the blue carpet of bloom, is absolutely bare in most places, with only a few scattering plants in favored spots.

Conversations with Doolittle

At Borodino

CERTAINTY IN QUEEN INTRODUCTION.

"I sent $10.00 for a special breeding queen. Now, have you any certain way of safely introducing a queen which has come on a long journey by mail?"

"The formula for introduction which comes with the cage and queen will answer very well where a man is buying from 10 to 100 untested queens, as the loss which occurs in using it is generally not large enough to pay for the extra work made by the absolutely safe introduction plans; but I had rather spend half a day on a very valuable queen than to run the risk with the ordinary instructions coming with the queen.

If you are willing to have the breeder in a nucleus, which many feel is best, then make a cage out of very thin wood and wire cloth, or of tin and wire cloth, large enough to take two of your regular-sized frames, and at the same time small enough so it will go into the hive and take the place of two frames. This is quite easily done where bright tinned wire cloth is soldered on tin ends and bottom. To this cage should be fitted a bee-tight cover. With the cage, go to any colony which can spare them, and get two frames of ripe brood—so ripe that you can see many young bees gnawing their way out from the cells. Shake and brush every bee off these combs and hang them in your cage. Now, before a window in a tight room, so if the queen should fly you can not lose her, open the mailing-cage and put her and the retinue of bees which came with her in the cage with the combs of emerging brood. Put on the cage cover, all secure, and hang this cage in any strong colony, letting it take the place of two frames, which, if they have brood in them, can be put where you took the two from which are in the cage. Now leave the cage for from three to five days, when, an hour or so before sunset, brush every bee off the outside and carry it to the hive where you wish the nucleus to stand, and hang it in this hive. Now carefully remove the cover and take out the frames of brood, placing them next one side of the hive, adjusting a dummy so it will make a little hive the size of the two combs. Fix the entrance at the opposite side of the hive from where the nucleus is, and put on the hive cover, allowing the few bees adhering to the cage to crawl out and go on the combs with the others at their leisure. In a week or so give this little colony another frame of ripe brood, and you will have a nice prosperous little colony from which you can secure larvæ for queen-rearing as often as you wish, unless you raise queens by the thousand."

"Why do you have the entrance on the opposite side of the hive from the nucleus?"

"So as to prevent robbing. In all my years of experience with nuclei, I never knew of a single nucleus being robbed out when established in this way. And very often, where robbing has started on a nucleus having its entrance right in front of the combs it contains, I have stopped it by changing the entrance, so to speak, by shoving the combs over to the opposite side and putting the dummy next to them. In this way the bees from the nucleus go and come from the same place they have always done, and easily learn to travel across the bottom of the hive to their combs, so they are not bewildered as they would be by changing the entrance instead of the combs. A robber bee does not like to travel over a long space where there is danger of being grabbed by sentinels strung all the way."

"The combs of ripe brood should have honey enough in them to keep the little colony in good heart while in the cage; and when put in the hive, if there is not enough to make them prosperous a frame of honey should be set in next to the *side* of the hive, not next to the dummy. By thus setting, we put the honey this much further away from robbers, for they must pass clear through the little colony to get it.

"If you wish to introduce a valuable queen to a full colony of bees, take their queen away early in the forenoon, or long enough before so the bees will miss her presence a little before sunset, at which time take all the frames of brood and honey from the hive, and put in a division-board feeder full of feed. This feed is preferable made of granulated sugar, but extracted honey will answer. Set this feeder away from one of the side walls of the hive about the space of two frames, and with a bent wire hang the shipping-cage containing the queen and her escorts so the cage will come two or three inches from the back side of the hive and midway between the feeder and the side opposite it. Or it is just as well to put two empty frames in this space between the feeder and the side of the hive, allowing the caged queen to hang between them, down two or three inches from the top-bars. Before putting in the caged queen, uncover the candy, as per the directions accompanying the cage; and when all is ready, cover the hive. Now shake and brush all the bees off their combs down in front of the entrance to their old home, into which they will at once run; and, if done near sunset, few will take wing during the commotion which will soon commence when they find out the changed condition. They will run over the hive for two or three hours; but before morning settle down to the conclusion that they can not find their old queen or combs, clustering about the cage and new queen. The combs of beeless brood may be given in an upper story to another colony to care for during the next two days, or until the queen is out, and has commenced to lay in the comb which will be built from the food in the feeder when their old combs should be given back to them after the feeder and two frames are removed.

General Correspondence

IS IT THAT NEW BEE DISEASE?

Something that Attacks Adult Bees in a Peculiar Way.

BY B. I. GILMAN.

I am in trouble, and very much in need of your advice. I have about 25 colonies of bees in two apiaries. These bees went into the winter in very fine condition. Every colony was very strong in *young* bees, with plenty of honey. A light honey-flow the last of September enabled the bees to store as many as three combs of honey to each hive. They had quite a lot of pollen, also. The bees wintered splendidly. I looked over the apiary in February, and all seemed strong; but I noticed that the honey gathered in September had not been capped. I could not see that they had used any of it. It was all granulated. I did not examine the sealed stores any more than to notice that they were using them up; about March 1st I noticed flies at the entrance of some stands. I examined at once, and found the bees dwindled to a handful. In some cases the bees were gone, leaving frames of honey. I examined every thing and found the honey granulated—no pollen. In colonies that appeared not to be affected I found them building up nicely—brood, but no pollen.

After our experience of last year of a pollen famine and starved brood, which we quickly corrected after reading an article in GLEANINGS, entitled "Pollen Famine," we commenced to feed equal parts of first-class cotton-seed meal and flour, which the bees took readily for about ten days, when natural pollen began to come in. The bees, however, continued to die, and in some cases they left brood in all stages (eggs to hatching brood). The bees have diarrhea or dysentery—the alighting-board shows it.

We have been reading Dr. Miller's article, Nov. 1, p. 664, "Diseases of Mature Bees;" also the article that follows, "Animal Parasites as a Cause of Bee Diseases." We are fearful that this disease may be *Nosema apis* in some form, although the voidings are bright yellow, coarse, and very copious. There does not seem to be any distension of body or bowels in dead bees. The frames of the affected colonies are not "messed up" at all, excepting where robbers have worked on the granulated honey; and even there, there is no sign of voidings. We find no dead bees around the hives nor in them, excepting in two or three hives where the bees seem to have starved to death from want of food—our neglect; and even in there, no sign of evacuations on the alighting-boards or inside the hive. The disease seems to have "let up" in one apiary where the loss was about 10 colonies in 150—a big loss for Southwest Texas. But at the home apiary they are still dying, but not so bad, however; and many affected colonies are building up nicely. In no case have we found a queenless colony.

The strongest colony in the home apiary, and one of the very few that have not been affected with this dysentery, has a golden Italian queen. This looks as though the golden queen were more immune than black or hybrid.

I will add that there are no apiaries within six miles of us; that some apiaries near Uvalde and Batesville are having heavy losses, probably from the same cause.

Pearsall, Texas, March 25.

[We have compared all the symptoms of the disease mentioned by Dr. Miller and Friedman Greiner, on pages 664 and 665 of GLEANINGS for last year. There are several things that suggest that it might be *Nosema apis;* although the voidings reported by you are yellow, you will notice in the articles referred to it speaks of the contents of the middle bowel being white. We do not know whether, in the downward passage, the contents become yellow or not. As it is, we are referring this to Dr. E. F. Phillips, of the Bureau of Entomology, and suggest that you send him at once bees that have died from this peculiar disease, and also a slat of wood or something showing the character and color of the voidings.

We would suggest that the affected colonies be put into a quarantine yard where there are no other bees, for we judge it would be dangerous to leave these bees that are affected in a yard where there are perfectly normal bees.

We can hardly think that the trouble can be due to pollen famine. While the lack of nitrogenous food affects the development of brood, it does not in any wise have any effect, direct or indirect, on adult bees. The fact that you notice that the bees are dying off in such large numbers shows that it is a form of dysentery; but as we have had such mild weather, if it is the old-fashioned kind we would naturally expect its ravages to let up after the bees get to flying. We should be pleased to know whether any of our subscribers have seen any thing like it.—ED.]

SPRING FEEDING.

Stimulation Usually Detrimental Because of Cold Weather that is Likely to Follow.

BY LEON C. WHEELER.

The advent of spring brings up again the mooted question of spring feeding. A few years ago, before I had tried it extensively, I was an enthusiastic believer in stimulative spring feeding; but as I began to make use of it in a general way I soon made up my mind it is largely a question of locality whether it would be a success or failure, and that in my locality the latter was the case.

When it was apparently settled warm weather I introduced my feeders and began feeding warm syrup, about half a pint daily. In a short time I could see quite a perceptible increase in the brood-rearing, and each hive contained all the brood the bees could cover, and I patted myself on the back. Conditions around the hive seemed to be about the same as during a light honey-flow; and as I watched their rapid up-building my enthusiasm for the system waxed high.

But my enthusiasm was destined to be short-lived, for there soon came a miserable cold spell of weather; and the bees, attempting to cover all the brood, lost down to a smaller amount than they would have had had there been no stimulation. When the cold spell was over, the dead brood was all dragged out unceremoniously by the bees, and deposited in front of the hives. Somehow as I examined those piles of dead brood my hopes of a bountiful harvest, which had been running high, suddenly dropped to zero. My enthusiasm for the system of spring feeding gradually oozed out. I was not entirely discouraged, however, but went on with the feeding until the beginning of the honey-flow. This honey-flow found the bees in as poor condition to gather it as any season since I have been in the business.

I have since tried it to a limited extent on a few colonies, beginning late in the season; and, while I have never had quite as bad luck since, still I have never been able to see that the colonies so fed showed any perceptible gain over those given combs of sealed stores, if, indeed, they did as well. The last two or three years I have made a practice of saving a lot of combs filled with honey gathered from the late fall flowers. This honey is not fit to use for winter stores, neither is it of any account to extract for sale; but for spring feeding it is excellent. Much of it is gathered so late that the bees do not cap it over, and will, for this reason, make use of it much more readily when set in their hives in the spring. As soon as the weather will permit, all colonies are examined and supplied with these frames of honey, each colony being given sufficient to last it until the honey-flow. Since using this method I have never experienced any difficulty in getting my bees in prime condition for the flow. Even colonies appearing to be very weak when opened up in the spring will usually, if given plenty of stores, be ready for the flow when it comes. If a few colonies do not appear to be building up fast enough to be in condition at that time I begin about two weeks before the flow, exchanging hatching brood from some of the overstrong colonies for eggs and unsealed larvæ from the weak colonies. This brings them to the required standard, and also helps to prevent the larger colonies from getting too crowded before the season.

Many writers have made the claim that a frame or frames of sealed stores would act as a sort of division-board in the hive, and that brood-rearing would be carried up to them and stopped. Now, this has never been the case with me; and, in fact, it very often happens that the best colonies I have are those which come out in the spring with a hive crammed full of sealed stores.

As I said at the beginning of this article, I believe that locality plays an important part in this discussion, and I can readily believe that, in a locality similar to that of the late E. W. Alexander, for instance, or in any other place where the main flow comes on after a long spell of settled weather, stimulative feeding can be carried on with profit to the apiarist.

But where one is liable to have cold raw spells of weather, and even snowstorms, sometimes right up to the beginning of the honey-flow, the system is worse than useless.

Barryton, Mich.

[Our correspondent's experience is quite in line with the experience of others who reported on this matter something over a year ago. The latest practice for most localities is to *feed liberally in the fall;* then in the spring, if certain colonies run short, to give combs of sealed stores that have been held in reserve, or from some colony or colonies that can spare them.—ED.]

A PLEA FOR THE RETAILER.

Co-operative Selling vs. Individual Selling of Honey.

BY T. EDWARD DIENER.

The article by Wesley Foster, p. 105, Feb. 15, indicates that the writer has had some unpleasant experiences with unwilling retailers, as he winds up by condemning the whole retail business as being responsible for the high prices of all articles designed for consumption. It will certainly take more than one man to solve the economic problems of the day, as they are not to be laid at the door of the retailer. I am not answering the above article because I feel capable of solving the problem, but because I wish to see the retailers of the country justified. I myself am a retailer, not of groceries, but of men's wearing apparel.

In my estimation, retailers have been hurt by the statement that they charge an excessive profit; but the fact is that, while the retailers are compelled to advance prices continually of late, their percentage of profit has been reduced. Of course, there may be occasional cases of profits of 38 per cent, but the average is considered to be about 25 per cent, out of which 10 per cent goes toward the payment of the running expenses of the business, such as light, rent, help, etc. But this does not cover many additional risks that occur in some lines, such as damaged, rotted, spoiled, faded, or out-of-style stock. This comes out of the other 15 per cent, so that the retailer is allowed, say, 5 per cent on his investment, and perhaps a few per cent for the time he gives to his business. There are many

lines of goods that are sold near the cost price, on which the retailer can not advance prices.

Mr. Foster thinks that co-operative selling might help the problem, but I do not believe so. Co-operation is effected for the purpose of getting as big a price as possible. We have good examples of what co-operation does in the large city department stores in a retail way. They do not sell any cheaper than individual retailers, on an average, but they do screw down the wages to a sinfully low standard, the surplus then going into their pockets as additional profits. If some individual retailers should get that amount of work out of their help they would willingly pay twice the wages paid by the department stores.

This economic problem will be solved in time by evolution, but all of us will have to work toward that end. In visiting farmers I occasionally find cases of waste in a variety of forms, which, if guarded against, would help to reduce the cost of some of the things from the ranks of the producers. We hear many encouraging words in the agricultural press of the good prices that all produce is bringing, which goes to show that the producers have also contributed their share toward advanced prices. I do not begrudge them this, for they certainly work hard enough to earn it.

Men not fit for the retail trade soon find out that it is best for them to retire (a natural law of business); but this hardly helps to increase prices, for competition keeps prices down to a central scale or level.

Elizabeth, N. J.

BUCKWHEAT-GROWING.

The Ground Must be Plowed Six Weeks Before Sowing, to Get the Best Results.

BY PERCY ORTON.

J. H. McGowan's article, p. 151, on buckwheat-growing, interests me very much, as I am a New York buckwheat farmer. Plowing and preparing the land makes all the difference between a good and a poor crop. You who intend to raise any this year, paste this in your hat: Plow at least *six* or *eight* weeks before you intend to sow and harrow, or, better yet, *disk* with Clark's double-action disk harrow once each week. If the land was plowed the fall previous, so much the better. If you don't think this early plowing amounts to any thing, try early and late plowing in the same field, and see the difference. It will be one-third in favor of the early plowing. I raised 20 acres last season, which yielded 27 bushels per acre of silverhull. This makes the most and whitest flour per bushel—ours this year 27 to 30 lbs. per bushel, selling wholesale at $3.00 per cwt.

I never sow as much per acre of seed as Mr. McGowan, and I don't wonder that he gets an enormous growth of straw when 1½ bushels of Japanese is sown to the acre. With me that was always the variety that branched the most, had the greatest amount of false kernels, made the poorest flour, and the least honey. I have had no use for it on our farms for ten years. The old-fashioned buckwheat is superior to Japanese for flour and honey.

Mr. Alexander told me, three years ago next August, when I was there at his home, that the farmers in his locality did not produce as much grain or flour while raising Japanese as they did with the old-fashioned black or silverhull; that his bees would fly right over Japanese to get to the black or silverhull. I mentioned this on p. 1504, Dec. 15, 1908.

THE AMOUNT AND KIND OF FERTILIZER.

I want to say that my best yields came from plowing and harrowing the field six weeks previous to sowing, using per acre ½ bushel silverhull, 30 lbs. nitrate of soda, 100 lbs. commercial fertilizer containing phosphoric acid 8 lbs., and potash 8 lbs., together with one bushel of sifted wood ashes, all mixed together and sown with a drill. This field contained six acres, 4½ of which was plowed early, and the other 1½ acres plowed and fitted two days before sowing, which was done July 8, 1909, and gave a yield of 165 bushels. The 1½ acres plowed last did not average half as much as the rest of the field. One acre of this had been in potatoes the year before, and was heavily manured. I expected the largest yield on that one acre, but was mistaken, as the sod ground did the best. It is very hard work to reduce the crystallized nitrate of soda so as to have it pass through the drill; therefore I shall use a commercial fertilizer containing nitrogen, 3½ lbs., phosphoric acid 8 lbs., potash 8 lbs., in every 100-lb. sack; also one bushel of *sifted* ashes. Set the drill to run 200 lbs. of fertilizer to the acre.

One of the "old granny" whims is the time to sow buckwheat. I say, sow it any time after all danger of frost is over in the spring—here, any time from June 1 to July 1—the earlier the better. If you ever planted potatoes on an old buckwheat-field some seed from the old buckwheat will always come up, and such always have the plumpest grain, even if it started to grow in May; therefore I don't take stock in late-sown buckwheat to prevent its "blasting" in the hottest weather, even if older persons say so; for in this section we sometimes have killing frosts as early as Aug. 27. Look out and get in between frosts.

Northampton, N. Y., March 7.

[One of the best crops of buckwheat we ever had was sown in the spring as soon as frost was out of the ground.

We are interested in that statement to the effect that Japanese buckwheat is inferior, both in point of honey and flour to the old-fashioned kinds. If we are not mistaken, we have had reports before to the effect that, although Japanese furnished more straw and more bushels of grain, it actually furnished less flour and less honey. How is this, friends?—ED.]

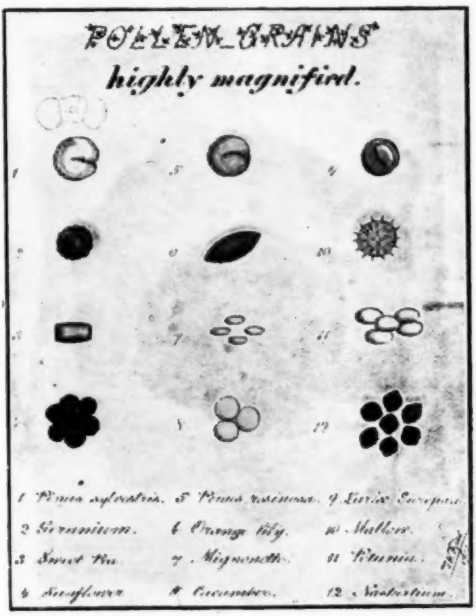
THE AGENCY OF BEES IN FERTILIZING PLANTS BY MINGLING THE POLLEN.

BY E. R. ROOT.

[The following is a portion of a chapter on pollen, in the new edition of the A B C and X Y Z of Bee Culture, now in the press. As it shows the intimate relation between bees and flowers we reproduce it in these pages at this time so that our readers may see and verify some of the wonderful things in nature. It is important, too, that the bee-keeper be informed as to the intimate relation between his industry and that of fruit-growing. Some fruit-growers and farmers are so ignorant that they imagine their neighbors' bees are robbing their flowers. They are just the kind of chaps who spray when their trees are in full bloom. A knowledge of the facts, as well as a little diplomacy, is needed to get such men to see that, so far from killing the bees (the goose that lays the golden eggs), they should welcome them as their *best friends*. The facts are gleaned largely from Fletcher and Cheshire. The latter appears to have drawn to some extent from Darwin and Gray.—ED.]

Before we consider the wonderful little schemes of nature to bring about the work of cross-fertilization, it will be necessary to give a few of the common terms employed in botany to designate the different parts of the flower. In the accompanying illustration we have a case of what is known as the hermaphrodite flower, that is to say; a perfect flower that is capable of self-fertilization. In most of the specimens that we show, we shall present deviations from the perfect flower. In most flowers we have the male and female organs, the latter represented by what is known as the pistil at the top of which is a receptive surface called the stigma. Sometimes there is a tube connecting the stigma with the ovary. This is called the style. The male organs are designated by the name of anthers. These contain little granules of powder known as pollen. Around the male and female organs are what is known as the corolla, consisting of leaves of various colors, and outside of these is the calyx, usually green. The stem that supports the anther is called the filament. The nectaries are usually located at the base of the pistil or the bottom of the flower as at B. The main portion of the pistil called the ovary is what constitutes the embryo fruit. In order that this may develop, the pollen from A must be conveyed in some manner to the surface of the stigma as at C. The fertilizing fluid passes downward, causing the fruit to develop. It would be well to bear in mind these botanical terms in the description which follows in order to understand how beautiful and perfect is the design of nature in bringing about cross-pollination.

—*From Fletcher.*


POLLEN GRAINS
highly magnified.
1 Pinus sylvestris. 5 Pinus resinosa. 9 Lilium Europæum.
2 Geranium. 6 Orange lily. 10 Mallow.
3 Sweet Pea. 7 Mignonette. 11 Pinus.
4 Sunflower. 8 Cucumber. 12 Nasturtium.

—*From Fletcher.*

Something should be said regarding the evident intent of nature to bring about crossing between the species both in the animal and the vegetable kingdom. Among animals, inbreeding has a strong tendency to weaken offspring. The same principle holds true to a certain extent among plants. "A study of the devices provided by nature to insure cross-fertilization," says Dr. Fletcher, forms one of the most charming branches of the whole study of botany." The great naturalist Charles Darwin is recorded as saying that the general principle can be seen running through all branches of the animal and vegetable kingdom. Although some plants, he says, can be and are fertilized by their own pollen, it is always of greater benefit to their descendants if the flowers be fertilized by pollen from other flowers of the same kind growing upon other plants. Darwin summed up his observations with the statement that "Nature abhors perpetual self-fertilization."

Since then, says Dr. Fletcher, "endless observations have confirmed the accuracy of Darwin's law; and it has been found that in the vast majority of plants special appliances exist which will secure a more or less frequent inter-cross." And then he goes on to say that these appliances completely exclude the possibility of self-fecundation.

Coming now to the special agencies for the fertilization of plants, we may say in a general way that there are two, the animate and the inanimate. Among the first mentioned may be included wind, rain, and the force of gravity. There can be no question but that pollen from some plants is blown not only from flower to flower, but, in some cases, clear out to sea. Cases are on record where pollen from certain species of pines has been found hundreds and hundreds of miles floating in the air and lodging in the rigging of ships. Rain doubtless has a large influence, because it spatters the fertilizing element from one flower to another. Gravity must necessarily convey the pollen located on the tops of the trees or plants to the blossoms situated further down, whether on the same or other plant of the same species.

Among the animate agencies for the distribution of pollen, insects (and especially bees) are by far the most important. To a very limited extent animals and birds may assist. While insects other than bees undoubtedly perform a very valuable service, the honey-bee, from the very fact that it is out earlier in the spring than all other insects, must necessarily be regarded as by far the most important means of bringing about cross-pollination among our fruit-trees; and even when other insects are in the air, it outnumbers any other species, and possibly, in some cases, all other species combined, a thousand to one. Its general shape and size, the special construction of its tongue and its legs, all together make it especially adaptable for receiving and carrying pollen.

—*From Fletcher.*

In the willows, for example, the male catkins, that is, the portion of the flower bearing the stamens, appear on one tree while the pistils appear on another. This technically is called staminate and pistillate inflorescence. As the willows are a source of honey as well as pollen, and as they come to bloom very early in the season, it is apparent that bees must play a large part in their cross-pollination. Common cases of male and female flowers on the same plant are found in the butternut, hickory, birches, oaks, and hazels. In some instances the male portion of the flower comes to maturity before the female, and *vice versa*. In others there seems to be an effort on the part of nature, through a special form and arrangement of the parts of the flower, to prevent self-fertilization. In this case it appears that the bee, or some insect, must carry the pollen from one plant to the other.

Mr. Cheshire in his magnificent work, "Bees and Bee-keeping," Vol. I., gives a number of very interesting examples of the work performed by bees. While he appears to have drawn from Charles Darwin and Prof. Asa Gray, his illustrations showing how Nature has sought to prevent self-pollination are so interesting and valuable, especially as they show the service performed by the bee, that we reproduce them here.

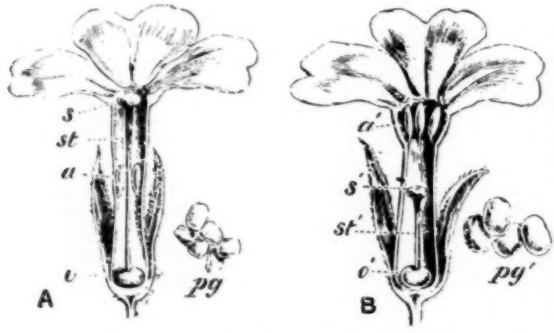


FIG. 3.—CROSS-SECTIONS OF DIMORPHIC FLOWER (PRIMULA VULGARIS, COMMON PRIMROSE), Order *Primulaceæ*.
—*From Cheshire.*

Cross-fertilization among some plants is brought about by the male and female organs, the stamens and pistils being located in different flowers, sometimes on the same plant or tree, and again on separate trees.

In Fig. 3 we have a cross-section of what is known as the common primrose (*Primula vulgaris*), that furnishes an example of

one of the most remarkable cases of how Nature has schemed to bring about cross-fertilization. This is what is known as a dimorphic flower, that is to say, there are two forms of flowers on the same plant. At A the stigma of the female portion reaches up to the mouth of the flower-tube. The anthers, or male portion, appear about half way down the flower-tube as at *a*. At B we have just the reverse: the stigma stands about half way down the flower-tube while the anthers are clear at the top. The flower-tube itself is supposed to be about the depth of the reach of a bee's tongue. A bee comes to A, reaches down at the point *o* for its nectar. The anthers half up dust the tongue at a point about half way up its length. After the bee has secured its coveted sweet, it passes to the next flower, B, where the upper portion of the tongue and mouth becomes dusted with the pollen from the anthers, and the pollen dust that was secured from the other flower A will just reach the stigma in the flower B. The pollen dust that was received from the flower B will just reach the stigma in the flower A. There is another significant and interesting fact, that the pollen granules of B are too large to be received in the stigma of B, but just right to go in the stigma of A. Thus we see how nature has cunningly devised a scheme of what is called dimorphic cross-fertilization. In other words, she has so planned it that the pollen of the same flower can not fertilize its own stigma, hence we see the necessity of some insect of just about the right size, as the bee, of exactly the same tongue length that the bee has. Let us take another example.

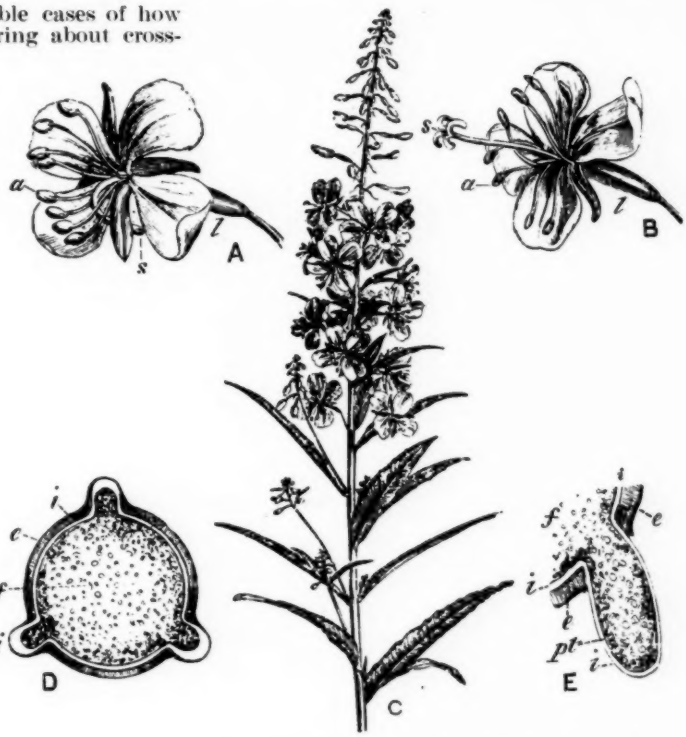


FIG. 4.—EPILOBIUM ANGUSTIFOLIUM (ROSEBAY WILLOW HERB), Order *Onagracew.—Gray.*

In Fig. 4 we have a very pretty example of the fine honey-plant willow-herb; here the pollen of the anthers is sterile to the pistil or stigma of the same flower. At A, Fig. 4, we notice that the stigma, or the style, rather, as at *s*, is turned backward away from the anthers at *a*. At this stage the pollen at the anthers is ripe. A bee comes along, dusts itself over the pollen

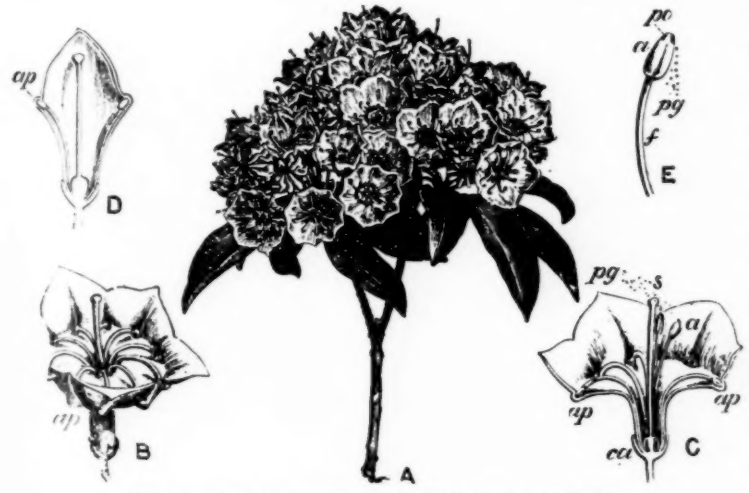


FIG. 5.—KALMIA LATIFOLIA, Order *Ericacew.—Cheshire.*

in the act of securing nectar, and then passes over to B of a flower of the same species. Here the pollen is gone from the anthers, but the pistil has straightened out and the stigma is ripe to receive the pollen that the bee brings to it from the anthers of A of the other blossom of the same plant. It will be apparent in this particular case, unless insects, particularly the bee, carry the pollen from A to B, there will be no fertilization of the plant, and the bloom will die without fruit.

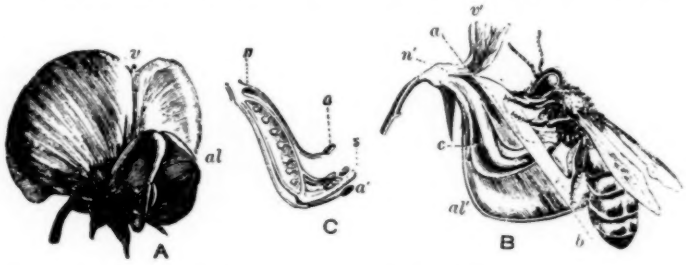


FIG. 6.—PAPILIONACEOUS BLOSSOMS, AND THEIR METHOD OF FERTILIZATION. —*Cheshire.*

In Fig. 5 we have another case no less remarkable of a near relative of rhododendron and azaleas. The filaments bearing the anthers are curved downward, the anthers themselves appearing to be held in little pockets of the flower. Apparently they have no power of their own to release themselves. But a bee comes along, alights on the blossom, and as it reaches around for the nectar jars these filaments loose, when they immediately fly upward, dusting the bees with pollen. This pollen now on the bee may fertilize the stigma or pistil of B; but as the bee goes from flower to flower the pollen is mixed, for it releases all the anthers, so that other insect visitation will continue on the process of cross-pollination. We have familiar cases of these anchored-down anthers in the rhododendrons, azaleas, and some of the swamp laurels. They are all honey-plants, but the honey is said to be poisonous.

In Fig. 6 we have a familiar blossom of the pea and bean, or technically known as papilionaceous flowers. At C we notice embryo bean or pea pod. At *a* we see the anthers and *s* the stigma. This whole thing is covered by a sort of wings. The bee comes along, pries them apart, and reaches for the nectar as shown in cross-sectional drawing of B. The anthers and the stigma both touch the bee on the under side of the waist where there is a good deal of hair. The result is that pollen is dusted on the waist of the bee; and as it goes from one flower to another, it mingles the pollen and dusts it over the stigma. The general shape of the flower is such that the wind could hardly accomplish much in the way of cross-fertilization, and apparently the bee has to exert some strength in forcing apart the wings of the corolla in order to get its coveted nectar.

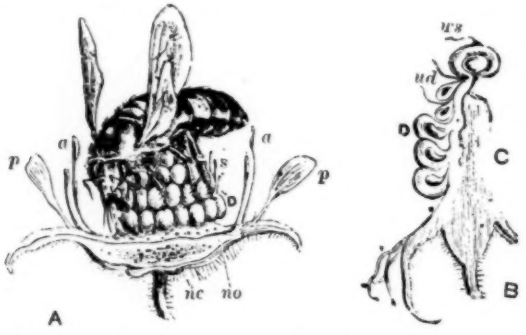


FIG. 7.—RASPBERRY (RUBUS IDAEUS, Order *Rosaceæ*) BEING FERTILIZED, AND SECTION OF SAME.—*Cheshire.*

In Fig. 7 we have the familiar raspberry blossom. This is a case of where there is very little color but considerable pollen and nectar to attract the bees. The anthers and pistils separated from each other appear in large numbers on each blossom. The bee alights on the head and reaches down for the nectar. As it does so, it brushes against the large number of anthers and pistils. In doing so it mingles the pollen, fertilizing the flower with its own pollen and with the pollen from other plants.

In Fig. 8 we have the familiar example of the apple-blossom. Note there are five stigmas and ten anthers. In many varieties of the apple, pear, and plum, the flowers are sterile to their own pollen; but, as Fletcher points out, they can be fecundated readily with pollen from flowers growing on another tree of the same species. We therefore see how very important it is to have insects, especially bees, to carry on this most important work of cross-pollination, without which there will be imperfect or no fruit at all. Many

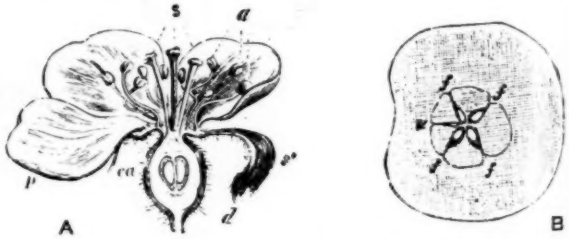


FIG. 8.—APPLE (PYRUS MASUS, Order *Rosaceæ*) BLOSSOM, AND SECTION OF FRUIT.—*Cheshire.*

and many a time a lack of fruit during some particular season is ascribed to the fact that frosts kill the blossoms, when, as a matter of fact, the weather has been such that the honey-bees were unable to get out, and thus carry on the work of cross-fertilization.

In Fig. 8 we have the case of an apple that was imperfectly fertilized. There is perfect seed and perfect fruit formation except on the side that has an indention. The statement has been made by some prominent growers of apples that it is such fruit as this that rarely hangs long enough to ripen. The first severe storm that comes along causes it to drop prematurely. One fruit-grower told us there were thousands and thousands of bushels of apples every year that are nothing more nor less than windfalls because of imperfect fertilization. This same fruit-grower went on to say that if the bees could get in their work properly, and the trees were sprayed before and after blossoming, the number of windfalls would be very considerably reduced.

In connection with this matter, the reader will be interested in referring to the subject of fruit-blossoms, elsewhere in this work, where limbs of trees and whole trees have been covered with netting while they were in bloom. The fact that almost no fruit develops under these nets shows that fertilization brought about by the agency of the wind is insignificant as compared with that accomplished by insects, and that, of course, means the bees, for almost no other insects are flying in the early spring when fruit trees come into bloom.

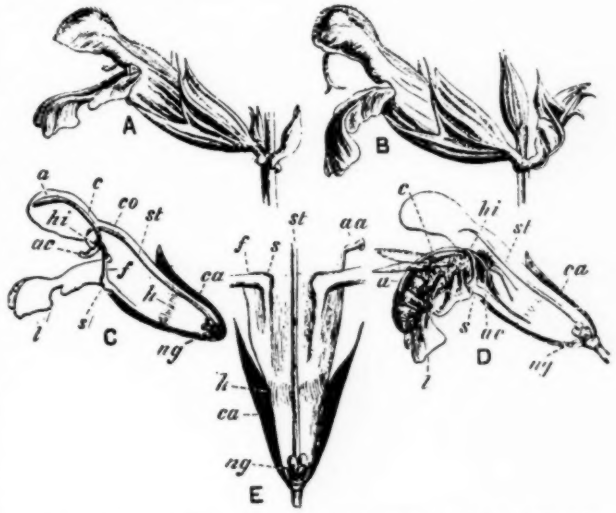


FIG. 9.—BLOSSOM OF SALVIA OFFICINALIS, Order *Labiatæ*—*Cheshire.*

In Fig. 9 we have a remarkable example of the flower of the salvias, among which we may mention the celebrated white mountain sage of California. Notice how Nature has made a convenient doorstep on which the bee may alight. But the more remarkable part of it all is, how the filament for the anthers is jointed. Turn to C, and it will be observed there is a spur or projection; namely, *ac*. The bee steps on the doorstep at *l*. Its head bunts against the projection, *ac*, causing the hinge-like movement to bend the anther, *a*, down upon its back, dusting it all over with pollen. The act can be seen a little more perfectly at D. Notice how the jointed anther is painting the back of the bee all over with pollen dust. In this particular flower, as at D, the stigma, for the time being, is sterile to the pollen of that flower, but the bee goes over to another specimen of the same species, as at B. It alights upon the doorstep, and, with its back all covered with dust, the stigma projecting out from its little canopy above brushes over the back of the bee, picking up the pollen, thus securing the fertilizing element from some other flower of the same species. When we remember that large quantities of beautiful honey are secured from what is known as the white moun-

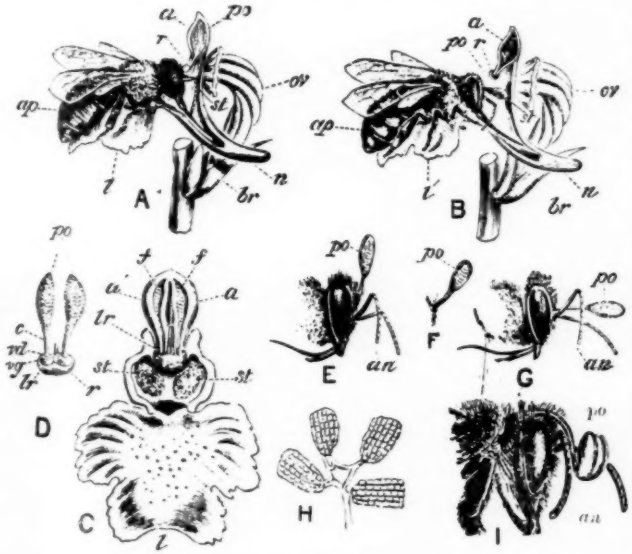


FIG. 10.—ORCHID (Order *Orchidaceæ*) BLOSSOMS AND DETAILS. —*Cheshire.*

tain sage, of California, we can realize the importance of this particular plant to the bee-keeper. Without this cross-fertilization the plant would undoubtedly "run out," as we say.

In Fig. 10 we have a still more remarkable case, as shown in the orchid. This flower is a little different in that the anther-sac has a sticky substance on the end, as shown at *r* in A. This pod adheres to the bee's forehead as shown at E and G. With this queer appendage containing its sac of pollen, the bee visits other blossoms, and, as seen at B, butts its head against the stigma and dusts it over with pollen. Chas. Darwin points out that this beautiful experiment can be accomplished with the point of a lead-pencil; but as it is not presumed that any foreign object should come in contact with the blossom except the insects we can see how insect cross-fertilization is accomplished in this most remarkable manner.

A REAL HONEY SIGN.

[The plan you describe, though good, is quite old. It is an old trick to most honey exhibitors. Our back volumes will show a number of engravings of raised and depressed letters in comb honey that have been shown at honey exhibits. It takes a good honey-flow and good bees to make a nice job. Not all bees will do nice work.—ED.]

SIGNS MADE OF HONEY.

How to Teach Bees to Write.

BY HENRY W. BRITTON.

For a number of years I have been studying the bee, and it seemed to me that they could be educated to write, print, cut, and carve or engrave letters or characters upon the frames or sections of honey made by them so as to be used as a trademark.

With this idea in view I began trying to educate them; and after the first lesson given them, they spelled my name, *Britton*, backward, as you will see in the picture in the frame resting upon the hive; but after a few more lessons they spelled it all right as you can see by the frame I hold in my left hand.

This frame of honey is all capped over, having my name on it in raised letters.

These raised letters were made by the bees, and consist wholly of honey and wax. I have never seen any thing like this in any of the bee books or magazines, and believe it to be something new, and submit it to the readers of this magazine for their perusal.

At the Brockton, Mass., agricultural fair last year I received a special prize for this novel frame of honey, and also a premium for my observatory hive of "educated bees."

Stoughton, Mass.

WATER REQUIRED BY BEES.

Some Interesting Experiments to Show the Exact Amount of Water Taken by Average Colonies in a Season.

BY B. J. WORSLEY.

From my experiments I have found that a good fair-sized colony of bees will take from 8 to 12 quarts of water during a season. I use watering-troughs made of concrete, similar in form to the Alexander feeder. I used five troughs, four of them for the bees and the other one screened so the bees could not get to it. The screened trough was for the purpose of determining the loss of water, during the period, by evaporation. There is a river about 20 rods from the apiary. The rainy days I had to disregard, as I had no control over them.

I once placed a new Alexander feeder under a good colony, in the month of May, put in it half a pint of clear water, and found that the bees took it in just two hours and twenty minutes. The greatest amount of water is used during the breeding season, for there is a large amount of water in the young brood.

I tried the experiment of placing frames of candied honey in an empty hive and con-

tracting the entrance to a small space. I put flour on the bees at the watering-trough and saw those same bees, marked by flour, go directly into the hive having the candied honey, stay inside from twenty to thirty minutes, then come out and go to their own hives. Later on they came out, went to the troughs for more water, then back to the hive having the candied honey. The bees kept on working this way until they very nearly cleaned up the combs in several empty hives that I placed for the purpose.

My bees are stationed about 20 rods from a mill-pond. The water in the pond is drawn down through the day, leaving the banks wet so the bees can get on them and pump up their supply of water. I found them so thick that it occurred to me that if it was water they wanted I could place it nearer, so the watering-trough was brought about. I am not certain how much they got elsewhere.

I believe there are locations where, in dry seasons, near-by watering would be a help. Since using the watering-trough I fancy that I have cut them off the pond by certainly a half.

Yes, bees certainly use much water and quite a little pollen. I like to have a cornfield nicely filled out for fall breeding. While they store pollen, I think they run short in a dry time. How they lug it in after a rain! I put it down as a fact that bees use water and pollen in their business.

Theresa, N. Y.

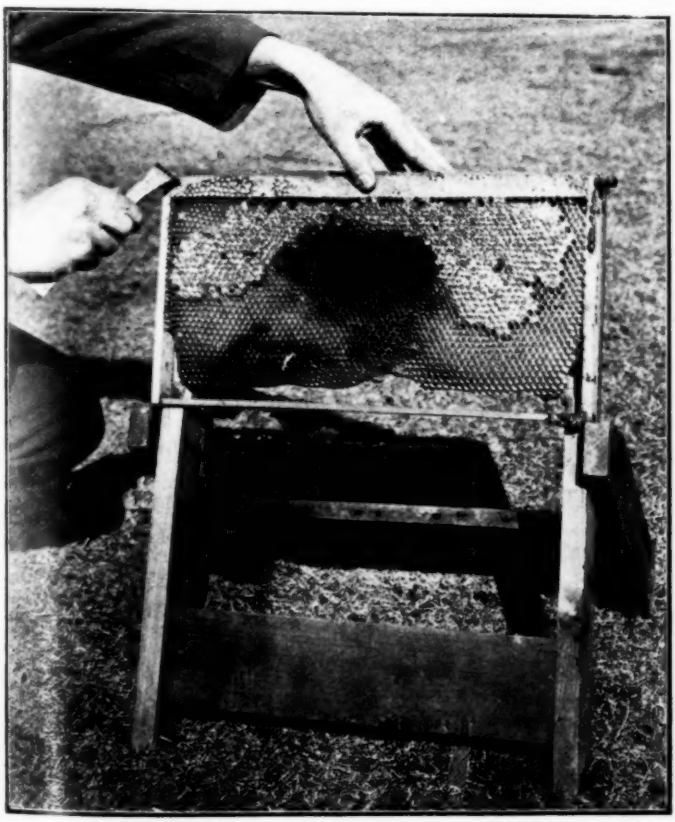
SPRING CLEANING.

A Handy Device for Holding the Frames While they are Being Scraped.

BY SIDNEY S. STABLER.

The accompanying photograph shows a device used at the apiary of the Maryland Agricultural College to hold frames in a firm position while scraping. It may be worth while for bee-keepers who make it their duty to scrape all brood-frames each spring to have one of these little "frame horses." They are just as big a help in scraping frames as the "wood-horse" is in sawing wood, and perhaps more, because the wood does not mind jarring as the bees do.

The construction is so simple that almost any bee-keeper can make one in a short time. Perhaps the best lumber to use is 1×3-inch poplar or oak for the legs and braces, and just a thin strip of pine for the top-bar.



A SUPPORT FOR FRAMES THAT ARE BEING SCRAPED.
Photographed by Prof. A. B. Gahan.

In using it I have a stool or box to sit on, and a hive-tool in my right hand and the horse in front of me. I sit at the back of the hive and take a comb from the hive and place it on the horse. I hold the top-bar with the left hand and scrape with the hive-tool in the right hand. Before I had this device I used to scrape over a box, but I like the horse much better. It will be noted that there is not much chance for bees to get mashed, as all the edges are purposely made sharp to prevent large points of contact.

With it we scraped all the frames from 20 colonies last spring, and intend to do the same this spring. We do not know how many bee-keepers make a practice of "spring cleaning" of frames; but we do know that too much of it can not be done, and that it can be much more easily done with some such device as this.

College Park, Md.

Carpet of "Texas State Flower," the blue lupine (*Lupinus subcarnosus*). The almost entire absence of this annual spring carpet this year indicates a dry season in most parts of the Lone Star State. See *Beekeeping in the Southwest.*

[There ought to be some sort of tray under the frame-holder to catch the wax scrapings, otherwise some of them will get lost. Wax in any form always represents cash.—ED.]

TREATING FOUL BROOD IN A HONEY DEARTH.

Boiling Hives more Effective than Steaming.

BY P. C. CHADWICK.

In the East I never had foul brood; and when I met it face to face in this country I was somewhat nervous as to my ability to cope with it. However, as I was associated with Mr. J. K. Williamson my fears were soon over, he being a very careful observer. This article is largely due to his headwork.

In the spring of 1903 Mr. Williamson had his bees rented to two parties, one of whom, I am sorry to say, was not as careful with the disease as might be after having been warned of the possible existence of foul brood. The result was, in the spring of 1904 the disease had been spread by the interchanging of combs to such an extent that it was difficult to deal with it. The season was very dry, with no honey-flow; and with the usual tendency in such cases for bees to rob, it would have been absolutely ridiculous to have put these diseased colonies on foundation, as it would have meant starvation. We just watched them closely, and if any showed signs of being overcome by disease we melted the combs, scalded the hives, and counted the colony lost save for the hive and wax.

Right here let me say that we have never had any trouble with hives used again after being properly scalded. Some of these colonies were carried over until the following spring with very little indications of trouble. Some we were compelled to melt up to save them from being robbed out, and the disease thus spread again. A few in which only a few cells appeared were "carved out"—that is, a small piece of comb was cut out around the diseased cells, and carefully destroyed; and, strange to say, most of the carved-out colonies are still intact, with no sign of the disease having reappeared after four years.

One colony, however, that was carried over during the dry year and put repeatedly on foundation the following season, and given nearly every known treatment for cure, during the following season was finally, as a last resort, sulphured at night, and bees, frames, brood, and honey were burned, after which the hive was scalded and used again. The wax from this colony might have been saved; but so many failures make one desperate, and thus it ended.

I do not believe Mr. Scholl's way of disinfecting, page 77, Feb. 1, is equal to thorough scalding, as this method does not reach the cracks and crevices as thoroughly as scalding water; neither do I see the object in scalding frames with lye and corrosive sublimate when hot water is just as effective, in my mind, and cleaner; besides, one can then save the adhering wax.

Redlands, Cal.

CHEMICAL COMPOSITION OF HAWAIIAN HONEYS.

BY W. P. KELLY.

For many years the chemical composition of most products of commerce has, in a general way, been known. In the manufacture of some of these the entire process is subject to the strictest control, and the finished product made to conform very closely to a given analysis. Included in the list of substances coming thus under chemical control may be mentioned various food substances, although their chemical composition formerly received only a general study. In recent years, however, the chemical composition of foods has been more thoroughly investigated. It is a strange fact that while, for many years, certain articles of commerce received the attention of expert analysts, a large percentage of the substances that go to form human food were not so carefully investigated. The farmer, for instance, is much concerned about the composition of the fertilizers which he applies to his fields, and often quite exacting in his demands; but the articles of food that he purchases are consumed with little inquiry as to their makeup. The average American has not taken the trouble to inquire into this question, and in this connection it may be stated that, at least until recently, we as a nation were far behind the more progressive European countries in regard to this point. A general awakening of the public conscience to a more intelligent inquiry concerning the purity of the substances of food, however, has led to a more diligent and careful study of their chemistry. Our Bureau of Chemistry of the Department of Agriculture, led by the efficient direction of Dr. H. W. Wiley, has devoted no small part of its attention to this subject, and, as a result, the American consumer is becoming better acquainted with the composition of his food stuffs.

Among the food products that have received such attention may be mentioned honey, although its composition has, in a general way, been known for many years. In bulletin No. 110, of the Bureau of Chemistry, is shown the chemical composition of honeys derived from a wide range of sources; likewise the subject of Hawaiian honeys was recently set forth in Bulletin No. 17 of the Hawaii Experiment Station. From these and other investigations it is evident that the source from which honey is derived determines in a considerable measure its chemical composition. The differences between the composition of nectar honey, such as white-clover honey, alfalfa honey, and algaroba honey, are slight, being principally those of color, aroma, and flavor; but the composition of honey-dew honey is strikingly different.

There are small variations in the composition of the same type of honey, as is shown by analyses of samples drawn from different places. This is due, in the main, to the fact that the honey-bee does not confine itself wholly to any one source of nectar, and, therefore, the average honey is a blend of various nectars, and also usually contains some honey-dew. As an average of many analyses, however, white-clover honey has been found to contain the following percentage composition: Moisture, 17.60 per cent; reducing sugar, 71.75 per cent; sucrose, 1.75 per cent; ash, .07 per cent; dextrine, .80 per cent; and free acid, .06 per cent.

Honey derived from the nectar of alfalfa contains 16.50 per cent moisture; 73.60 per cent reducing sugar; 4.4 per cent sucrose; .07 per cent ash; .34 per cent dextrine, and .08 per cent free acid. The famous algaroba honey, which is produced in such abundance in Hawaii, has been found to contain 17.1 per cent moisture; 80.3 per cent reducing sugar; 2 per cent sucrose; .44 per cent ash; 3.57 per cent dextrine, and .1 per cent of free acid. The above analyses are for nectar honeys. We will now consider the honey-dew type, which is produced so extensively in Hawaii. This has been found to contain about 15.5 per cent moisture; 62.1 per cent reducing sugar; 5.25 per cent sucrose; 1.3 per cent ash; 10 per cent dextrine, and .15 per cent free acid. From the comparison of the above figures, it is apparent that honey-dew honey is quite unlike nectar honeys in chemical composition, containing considerably less reducing sugar, and very much more ash, dextrine, and sucrose.

There are, however, still greater differences between nectar honeys and honey-dew honeys than are shown by the above analyses. When polarized light passes through a solution of nectar honey at a temperature of 20 degrees it is usually rotated to the left, while honey-dew honey rotates the plane of polarized light to the right. After nectar honey undergoes "inversion," as it is called in chemistry, rays of polarized light passing through its solution are again rotated to the left at a temperature of 20 degrees; while honey-dew honey, on the other hand, continues to rotate to the right after inversion. Right-handed polarization in honey has long been regarded as evidence of adulteration with commercial glucose or sucrose; but in the case of honey-dew honey this explanation will not hold for its right-hand polarization, since samples of known origin, and those free from adulteration, possess this characteristic quality. Its explanation is found in the high percentage of dextrine and other gummy-like bodies which are always found in honey-dew honey.

Notwithstanding the material difference in chemical composition between honey-dew honey and nectar honey, both are natural products, collected and stored by the honey-bee, and as such are free from adulteration in the usual sense of the word, and may, therefore, be used without fear of their containing commercial glucose or other added sugars.

Algaroba is the source of one of the most beautiful honeys on the market. It is almost white in color, and possesses a very delightful flavor and aroma; and, although it is but

little used for table purposes, since practically all Hawaiian honey is sold to the baking trade, it has but few equals and no superiors as a table honey. Honey-dew honey, on the other hand, is a dark viscid substance, and is wholly unlike other honeys in flavor, etc. It is entirely used in the baking and confectionery trade, where it is highly prized, since it possesses baking and boiling qualities superior to that of other honeys. By far the greater part of Hawaiian honey is neither algaroba nor honey-dew honey, but is a natural blend of the two. In fact, there is no distinct division between the two types, each merging imperceptibly into the other. It has been recently decided by the Pure-food Board that honey-dew honey may be sold under the pure-food and drug act by being labeled "honey-dew honey;" and since it possesses such exceptional baking qualities, and is not brought in competition with table honeys, in so far as table use is concerned, it is quite certain that the demand for the product will continue to increase, and especially since it is now a well-established fact that honey-dew honey does not contain commercial glucose or other added sugars.

WINTERING ON HONEY-DEW IN A MILD CLIMATE.

Interesting Comparison of Vigor in Different Strains of Queens.

BY F. DUNDAS TODD.

The season of 1909 on Vancouver Island resulted in a complete failure so far as honey was concerned; but the bees did the best they could by storing up great quantities of honey-dew. It is needless to say I looked forward with considerable anxiety to the wintering, hoping the season would be one of the old-fashioned kind they talk about here when bees were confined to the hive for only a few days at a time. Pollen carried in on Christmas day, flights in the middle of January—these sounded good to me; but would they materialize in the day of need?

My duty, however, was to see that a reasonable amount of good stores was provided; so in the middle of September each hive was carefully overhauled, and an estimate was made of the stores, weak colonies being combined with three exceptions which I left as they were, to see what would happen. I have no desire to be a paragon of wisdom all at once, because you know a little foolishness provides a certain amount of excitement. Right here let me say two out of the three died, the survivor being the weakest of the lot.

Having learned the total quantity of stores on hand, the next step was to average by exchange of combs the quantity in each hive. The result was that about 17 lbs. of honey-dew was bunched in the center of the division (I use the divisible hive); then about 10 lbs. of sugar syrup was given to fill up the outside frames. Each hive thus had from 27 to 30 lbs. of stores; but one was left with 40 lbs. of honey-dew and 10 lbs. of sugar stores to see what would happen. It turned up queenless in March.

Most of my bee-keeping friends did not feed until a month later. Probably they were wiser than I because it made more certain the consumption of honey-dew before winter set in. Given the same conditions again, I feel I would postpone feeding till the last possible moment.

The winter was not an open one by any means. Flight ceased by the end of November, and not a bee was seen until January 11, when sunshine and a temperature of 45° drew bees from most hives, some quite freely. Ten days later the weather was warm enough for a good flight; and as every hive showed signs of life the worst was thought to be over. Hives were hefted, and four that seemed light were given candy under the quilt. Out of curiosity the frames of one hive were quickly gone through, and note made of a patch of eggs covering a space three inches in diameter in one of the frames. On March 12 this same colony showed brood in four frames, but very little of it sealed. The overhaul of the apiary at that date indicated that egg-laying did not start until March 2, the day on which the first pollen was carried in.

On Feb. 8 one hive was suspiciously silent, and examination showed it to be dead of starvation, but with three frames of stores in the house—unfortunately, on the wrong side of the hive. Two weeks later the thermometer dropped to 18, and we got six inches of snow; but the thaw came on the 26th, with a temperature of 50°, and we had bees flying freely with snow on the ground. Four silent hives were opened, all being apparently dead, two hopelessly so. Two, being free of mold, suggested a possibility of a resurrection, so they were at once set over strong hives with wire netting between. Sugar syrup was trickled between the frames. Two days later one was alive, and therefore returned to its own stand; but the other was beyond hope of recall. This is the second time I have restored to life an apparently dead colony after a short cold spell.

Heavy rains followed the thaw. March 2 was warm and pleasant, so the bees flew freely, three colonies making a start with the carrying-in of pollen, the very first being the one headed by the best queen of last season's importation. It was in fine condition, having wintered with the loss of not over a hundred bees, as shown by an examination of the bottom-board on Feb. 15. About March 7 the weather was delightful, so the bees hustled in pollen at a great rate; and now was the time to make some estimate of inside conditions by outside signs. Several hives had plenty of bees flying about the entrance, but little or no pollen was being carried in; so, feeling suspicious, I overhauled the whole lot on the 12th, when the thermometer rose to 63°. In 21 colonies I found brood-raising was well under way; but 7 had no signs of eggs and no fresh pol-

len in the cells—in this respect being in great contrast to the colonies where brood-raising had been started, for there the golden-yellow pollen was conspicuous in areas as large as one's palm. Two days later the suspicious hives were gone through carefully; but no brood being found or queens visible, the colonies were combined with others.

By the middle of March the net result of my first experience in wintering with honey-dew in the hives was thus: Alive, 21; dead of starvation, 6; queenless, 8. The resurrected hive had, on Feb. 26, been combined with another whose queen was found lying outside. The combined colony showed brood in a couple of frames on March 12, but I noticed a slight dent in the abdomen of the queen.

Once the returns are in, comes the interesting work of making percentages of the results; but, unfortunately, it is not always easy to unravel the complications that naturally arise. For instance, I have bees in three styles of hives—eight-frame Langstroth, two division divisible, and one division divisible. Then I have at least three strains of bees, one being the old stock I bought here; another I got from Kentucky in 1908; the third from Texas in 1909. All in all, the stores were fairly uniform, as were the entrances.

I could not wait patiently for the final returns, but began to estimate from the number of dead bees on the bottom-board when I changed them on Feb. 15. One showed less than 100, while in others the corpses would have filled easily a pint measure—I am tempted to say a quart. I roughly grouped the hives into two classes of few and many dead, then proceeded to work out the results. First grouping by hives, I found that fifty per cent of the Langstroth fell under the heading of "many dead;" double division showed 16 per cent; single division, 6 per cent. Let it be noted here that, out of six Langstroth hives, five contained the old strain of bees. This is important, as later facts will show. On classifying by strains of bees I found 30 per cent of the old stock, 12 per cent of the Kentucky, and 16 per cent of the Texas had "many dead" recorded against them.

When the returns were complete I considered the death of the queen as equivalent to the death of the colony. Percenting by hives first, I found one out of six Langstroths had died, equal to 16 per cent loss; three out of seven double-division colonies were lost, being 43 per cent; ten out of twenty-two single-division colonies died, being 45 per cent loss.

Turning next to strains of bees, I found half of eighteen old-stock colonies had become extinct; loss, 50 per cent; three out of eleven Kentucky stock; that is, 27 per cent; two out of eight Texas stock, being 25 per cent.

I have already reported in GLEANINGS great mortality among queens in this locality, hazarding the opinion that it was due to the lack of vigor in the stock, which, owing to the isolation on an island, had probably become decidedly inbred, and the above figures would seem to confirm my previous suspicions. This summer will probably see the end of this strain in my apiary. However, it is but fair to say that all the old-stock queens in Langstroth hives, five in number, survived the winter, and were showing good results in egg-laying by the middle of March.

A year ago I was of the opinion that one hive was as good as another for wintering in; but this winter the Langstroth is easily first. So I have still one more guess coming; also a second, for a few days ago I cursorily examined a few colonies belonging to a man who had left the province at the beginning of winter. I found them in home-made hives of not more than a foot in cubic dimensions, with entrances galore, several in the bottom just a bee-space deep, an inch and a half long, and at least one in each front about four inches from the top, this being circular, of ¾-inch diameter. As the bees were piling in pollen as busily as my best hives, I considered the colonies in good condition.

One hive had no quilt of any description, being merely covered by a plain board with cleats on two ends, so all winter it must have had more than enough ventilation not only through the upper entrance but through the top of the frames. Rain, wind, and frost had done their worst; but the bees were as spry as could be. The owner goes off for months at a time, and I could venture the guess he did not feed them in the fall, and, if not, they must have wintered on honey-dew. Such propositions make one ask, "What do we know about bees, any way?"

Victoria, B. C.

REAR VENTILATION AT THE BOTTOM OF THE HIVE.

How it Stopped Swarming.

BY S. F. PETERS.

I was much interested in the article "Ventilation of Hives during Summer," by J. P. Blunk, page 229, April 15, 1909. I had two colonies in Langstroth hives—one a new May swarm, and one from the year before. As soon as the weather grew warm I noticed a large number of bees kept from work by fanning, or ventilating hives by fanning; so I tried Mr. Blunk's plan by putting a ¾-inch strip under each side of the hive, leaving a ⅝-front opening and a ¾ entrance in the rear, full width of hive. Having only two colonies near the house I cut a strip of the proper length and height to slip into the rear entrance for cool days and nights. By reversing I could have a ⅜×4-inch or ⅜ entrance, width of hive front. I watched my hives closely, and had entrances according to weather.

As soon as I made the double entrance all fanning was stopped, and bees went to other work. Sometimes the weather would get

warm while I was away from home, and I would find plenty of bees ventilating; but inside of ten minutes after the entrances were opened the full extent, all fanning stopped, and the bottom-board would contain only bees on the move, in or out of the hive.

When these colonies got strong enough to cluster outside (of only half a pint or so), I added another super to give them plenty of room. I put two rousing colonies into winter quarters. I had, of course, plenty of sections that were unfinished.

Another thing, while all my neighbors had swarm after swarm from the same old hives, neither of mine swarmed at all. This would not have been unexpected from the May swarm; but the other, an old colony, failed to swarm, although it was a good strong colony. When the buckwheat flow was over I had three supers on each hive.

Brick Church, Pa., Feb. 2.

[If more of our bee-keeping friends would give more attention to bottom ventilation there would be less clustering-out and less of swarming. Our neighbor, Vernon Burt, thinks hives set up on four blocks off the bottom goes a long way toward stopping swarming altogether. It is such a simple trick it is a wonder that more do not try it. —ED.]

CALIFORNIA STATE CONVENTION.

BY MRS. H. G. ACKLIN.

The twentieth annual convention of the California State Bee-keepers' Association was held in the Chamber of Commerce, the 14th, 15th, and 16th of February.

Mr. Scott, the incoming president of the Chamber, welcomed us in a happy little talk. He mentioned that the Chamber would do all it could for the bee-keepers, and in return the association ought to keep a live exhibit (not bees) of honey which had not come out of the ark, in the exhibition rooms of the Chamber of Commerce.

In response, Prof. A. J. Cook said, among many other things, that the fine scenery California bee-keepers always have when in their apiaries should tend to make them good honest men, and he thought they all were. In fact, there can not be many bad people in the midst of such magnificent natural views as we are continually feasting our eyes upon.

California bee-keepers appear to have implicit faith in the National, as our president declared, when urging people to join the association, that the National had never failed to "bust" an ordinance that oppressed a bee-keeper.

During the morning session Prof. Cook took occasion to introduce several eastern people, only three of whose names I now recall—Mr. H. B. Harrington, of Medina, O., Mr. Coggshall, of New York, and Mrs. H. G. Acklin, of St. Paul, Minn., and the convention welcomed us in a body. Mr. Harrington was called on to speak, and in the course of his remarks told how Mr. A. I. Root commenced making bee-hives.

There were two evening meetings, at which music, both vocal and instrumental, stereopticon views, and addresses, were the principal features.

Those having papers were: Mr. J. W. Ferree, Newhall; Mr. J. W. George, Imperial; Prof. A. J. Cook, Claremont; Mr. C. M. Richter, Santa Barbara; Mr. J. E. Pleasants, Orange; Mr. Ralph Benton, Berkely; Mr. M. H. Mendleson, Piru; Mr. Joseph Moffat, Los Angeles; Mr. T. O. Andrews, Corona; Mr. G. J. Lynn, San Fernando; Maj. G. F. Merriam, Twin Oaks; Mr. C. A. Wurth, Ventura; Mr. Bishop.

There is a very strong feeling, apparent at all times, in favor of organization and co-operation among California bee-keepers for mutual protection. They claim every other big industry is organized, and why not honey-producing?

There is much uneasiness at present in the southern part of the State concerning conditions around Fresno. Black brood has made its appearance up there with such sweeping and fatal results that every bee-keeper, familiar with the situation, is alarmed. Quarantine resolutions were introduced during the convention.

The former president, B. G. Burdick, of Redlands, was re-elected; also Secretary and Treasurer, A. B. Shaffner, of Los Angeles. The vice-presidents, one from each county, are the presidents of the local societies or clubs. The convention was well attended, and much interest was manifested in most of the subjects discussed.

After adjournment of the State convention the bee-keepers of Los Angeles Co. got together and organized a local society; elected officers, and appointed a committee to wait upon the county board of supervisors in regard to establishing a quarantine against bees being shipped into this county from any section infected with black or foul brood.

Los Angeles, Cal.

SECTIONAL HIVES FOR COMB HONEY.

Criticisms Come from those Who have not Understood the Special Management Required.

BY LEO E. GATELY.

Previous to the adoption of the sectional hive in my apiary several years were spent experimenting with and testing the merits and demerits of the various styles, in an endeavor to determine exactly what style and depth were best adapted to the exclusive production of comb honey. Its adoption, therefore, was not the result of mere chance or prejudice, but rather because it stands preëminently unequaled in flexibility and economy of management.

In a great many (and perhaps most) localities, some form of contraction is a necessary essential in securing satisfactory

work in the supers. With unlimited skill it is impossible to attract the bees into super work so long as there are empty combs below. In this respect all deep hives, if not utter failures, are at least fundamentally bunglesome. To contract the hives by replacing some of the frames with wooden dummies invariably results in poor filling of the outer sections, and in getting them completed with the central ones. Obviously, the only remedy is to contract from the top, without reducing the supering surface. With a hive in which the brood-chamber is horizontally divisible, the mere removal of one or more of the hive divisions or brood-chambers contracts it to the desired capacity.

The divisible hives in most general use are built to hold the common square section, as they were fashioned to fit the Langstroth frame. My present one was built for the modern 4 · 5 section, and, like one or two others, the super was first considered in planning its general construction. Again, instead of making the brood-chamber deeper than the super, as is usually done, the hive was cheapened and simplified by making each division one and the same thing in every detail.

Owing to the frequent mistake of having applied the identical methods of management to the sectional hive that has been habitually given to single-chamber ones, it is constantly receiving an endless amount of unjust criticism from those who suppose they have given the matter close investigation. The principles contained in the two hives are radically different, and the most valuable features of the sectional hive are manifested only when proper methods of handling are employed.

Years ago practical honey-producers fully demonstrated the feasibility of handling hives instead of frames. It is possible to determine the condition of a colony by elevating one of these hive divisions and looking between the comb surfaces, as well as the apiarist who tediously goes over his hives frame by frame. With proper management one can thoroughly handle nearly twice the number of colonies that he can when single-chamber hives are being used.

The one redeeming feature of a deep hive lies in its excellent wintering qualities. A shallow hive can never be an ideal winter hive. Let it not be forgotten, however, that a sectional hive is not necessarily a shallow one, but may be made at will of any desired depth.

While, generally speaking, it is advisable to have no more than one style of hive in the apiary, this rule can not always be too strictly adhered to. A divisible hive and a deep one that will tier up perfectly is at times even handier than either when used alone. For instance, when colonies build up sufficiently in spring to require additional room, and the flow has not yet been reached, a shallow chamber will usually give just the correct amount of room to discourage swarming. When the flow appears, these shallow chambers can be replaced with surplus-receptacles, and be used for hiving swarms or making new colonies. Under such circumstances, two styles of hive go well together, but they must be of proper dimensions to tier up perfectly.

Ft. Smith, Ark.

STOCKING A BEE-RANGE.

The Problem of Overstocking; Various Causes of Annual Variations and Marked Changes in the Varieties and Quantity of Honey-producing Flora; is a Range Overstocked When the Surplus per Colony Begins to Decrease? Number of Acres Necessary per Colony.

BY OREL L. HERSHISER.

How many colonies of bees are required to stock a location properly?

The bee-keeper has a general idea as to the value of a bee-range. If there is an abundance of one of more varieties of honey-producing plants within easy bee-flight of the apiary it is esteemed a good location. But the number of colonies required to work a given area to best advantage has rarely been approximately ascertained. While it is a perplexing problem, probably impossible of exact solution because of the varying climatic conditions, yet there seems no doubt that a much nearer approach to a knowledge of the average annual net possibilities of our locations may be had.

It has been observed that, when a location was supposed to be stocked with as many bees as it could profitably support, afterward the number of colonies has been doubled or trebled without producing any noticeable decrease in the yield per colony. It has been the experience of bee-keepers who thought they had their locations stocked to the limit of profitable production, that some other apiarist, wishing to share in the excellent honey crops of the locality, has moved upon the same territory, sometimes undoubtedly resulting in some decrease in the yield per colony, but often without producing any noticeable difference. On the other hand, it has been noticed that, where the number of colonies in some fairly large apiaries has been greatly decreased there has been no apparent increase in the yield per colony.

The value of a location is not to be determined by a single season's honey crop, and very often not for three or more successive seasons, but from its average annual possibilities as ascertained by observations for a period sufficiently long to give us confidence as to what we may expect. A location may be capable of producing abnormally large crops, but they may occur so infrequently, and be followed by so many seasons of failure, as to make it of no value to the specialist. A location productive of plants that annually yield nectar in abundance is valuable in proportion to the acreage or amount of the flora; and if so limited as to supply a good crop to but few colonies it would be of no value as a field for extensive operations.

There are many kinds of good locations; but all may be classified under two general heads—one wherein a single variety of dependable nectar-yielding plants is abundant over a large area, and which has a long period of blooming, such as clover, basswood, wild red raspberry, buckwheat, alfalfa, sage, etc., or where two or more dependable nectar-yielding plants that bloom at the same time are abundant; the other, where several varieties of dependable nectar-yielding plants that bloom in succession or at different periods of the season are abundant over a large area. Supposing the total amount of flora in the first-mentioned kind of location to be the same as the total from all sources in the latter, the former is capable of profitably supporting the greater number of colonies, for the reason that the honey-flow, while shorter, would be nearly as profitably worked per colony by the greater as by the smaller number of colonies that would properly stock the latter. In the latter kind of location the smaller number of colonies that could be profitably kept would be compensated for by the greater yield per colony, owing to the prolonged honey-producing season.

Since it would be unprofitable to keep enough bees in a location to gather all the nectar as we would harvest a crop of potatoes, corn, or wheat, where we secure practically all that has matured on a given area, we must do the next best thing if we would get the most out of the apicultural pursuit and keep in the apiary the number of colonies, as nearly as we can determine, that will produce the greatest amount of honey at the maximum net profit.

A location is not stocked to yield the greatest net profit if we stop increase at the point where there is the first perceptible decrease in the amount of honey per colony. The number should be increased as the yield per colony decreases until the point is reached, as nearly as may be determined, where the apiary can be operated at the greatest net profit. Thus will the greatest possible amount of God's bounty to the apiarist be made available for the use of humanity.

Suppose A has found by experience that 300 colonies will produce an average annual crop of 60 lbs. per colony or a total of 18,000 lbs.; and suppose B, three miles from A, with 100 colonies on an exactly similar location as to honey-producing possibilities, obtains an average annual crop of 80 lbs. per colony, or a total of 8000 lbs. It is obvious that the difference of 10,000 lbs., in A's favor, the skill of the operators being equal, is due to his having stocked his location more nearly to the limits of profitable production.

The reasonably frequent occurrence of first-class crops of honey indicates a good location, even if there are a good many seasons of failure. As a case in point, I have in mind a bee-keeper of California having several apiaries in a certain locality, and in a good season the yield is in excess of 100 lbs. per colony. In 1901 there was a first-class crop; in 1902 there was a failure to the extent that the apiarist expressed himself as being able to "carry his crop under his arm." In 1903 there was a full crop of 100,000 lbs. Within ten to twelve miles of this location there were thought to be 10,000 colonies of bees, as I remember the statement of my informant, which shows the estimation in which the locality was held, notwithstanding some seasons of total failure of surplus.

In 1905 I had 100 colonies in a certain location, and within 80 rods were at least 50 other colonies. Alsike, white, and sweet clover were abundant and luxuriant, and my crop was 100 lbs. per colony, with an increase of 75 per cent. Residing about three-fourths of a mile from the apiary I had good opportunity to observe; and as I had the only considerable number of Italians within several miles, my bees were easily identified. I saw very few of them more than one mile from the apiary, although during the honey-flow they flew from and to the hives in great numbers. The apiary was located in the city where considerable of the area is occupied by streets, buildings, gardens, railroads, and numerous barren stone-quarries. An estimate that one-sixth of the area was covered with an abundant growth of honey-producing forage would be approximately correct; and if the bees flew in all directions the same as they did where I made observations, which was a wide expanse of clover, I am of the opinion that during the honey-flow, not more than five per cent of them flew more than a mile from their hives, and those not greatly in excess of that distance. The area of a circle one mile in radius is 2010.6 acres; and, if my estimates are not at fault, 95 per cent of my bees gathered their part of the honey from about 335 acres of flora, or about 2¼ acres to each of the 150 colonies on the range. As the area of a circle increases rapidly as the radius increases it will be seen that, by a flight of a few additional rods from the apiary in all directions, a greatly increased area may be reached. Thus while the area of a circle having a radius of one mile is 2010.6 acres, that of a circle having a radius 1½ miles is 4523.9 acres, or an area 2¼ times that of the circle with a one-mile radius. The bees, by a flight of half a mile beyond the one-mile radius in every direction, would reach 2513.3 additional acres. It seems quite reasonable to believe that bees can work profitably to a distance of at least 1½ miles; and as my bees and those of my neighbors did not seem to stock fully the location to a radius of one mile, 2¼ times the number or 338 colonies would not have crowded the location; and I firmly believe the number of colonies that could have been worked at greatest profit there that season would have been in excess of 500, or at least one colony to each 1½ acres of flora. The honey crop at this location for the four preceding seasons was above the average with nearly the same number of colonies. That of the season of 1906 was a failure with the same number; but it is my opinion that, with 10 colo-

nies, the failure would have been nearly as marked.

For the purpose of an analogous comparison, suppose a number of berry-fruit farms aggregating 750 acres, all situated within a circular area three miles in diameter. Suppose an abundant crop of berries. It is evident that with such a crop, and so many acres of bushes, 100 pickers would each be able to gather the maximum number of quarts per day, because it would be impossible for a picker to go carefully over anywhere near 7½ acres, the proportionate area of each, as fast as the fruit ripens. With a stint of 1½ acres each, assuming that 500 pickers is the approximate number required to gather the fruit with greatest profit to the growers in the average reason, it is evident that each could still gather the maximum amount when there is an abundant crop. Assuming two acres to be all a picker could possibly attend to in a season of less than the average crop, when no picker could possibly gather anywhere near the maximum, no matter how much area was allotted to him, very little advantage to the individual picker would accrue by the employment of a less number than is required in the average season. This is evident from the fact that, when the fruit is thinly distributed, and of small size, the picker's time is largely taken up in searching over a large area to gather a given quantity.

Let us now assume that 750 acres of this circular area is a first-class alsike-clover or other good honey-producing range, and that a bee-keeper resides in the center so his bees can reach every part of it with a flight of not more than 1½ miles. Assuming that 1½ acres of flora per colony is the area that will yield the greatest profit in the average season, from analogy it is clear that neither 100 nor 500 colonies would overstock it, and much less would they do so in a season of bountiful crop. On the other hand, in a season of failure of surplus there would be only a slight overstocking, wherein the small loss would be insignificant as compared with the great gains of the average and bountiful crops. In the medium season the larger number would prosper nearly as well as the smaller, because 1½ acres of thickly growing honey-producing flora would undoubtedly be as much as the average colony could work; and when it comes to nearly a failure of nectar secretion, the larger number would show only a slight falling-off, for the reason that the time of the bees is nearly all consumed in flying from flower to flower in the almost fruitless search. This statement is impressive when we remember that apparently, in the season of 1909, we had the most luxuriant and abundant basswood bloom we ever saw that certainly promised a bumper crop, but there was never a smell of basswood honey in the hives.

Further confirmation of the proposition that, in a season of scarcity of nectar secretion, a few colonies in a normally good location will do very little better per colony than the number that would properly stock it in a good season, is found in the fact that in a poor season the bee-keeper with a few colonies is found to have a "short crop," and is "obliged to feed," just as is the apiarist who operates on an extensive scale.

It is well to bear in mind that annual variations and permanent changes in the amount, area, and varieties of honey-producing flora have occurred and will continue to occur in nearly every locality. These variations and changes are traceable to two prime causes; viz., to the absence of uniformity in those conditions that go to make up the climate, such as heat, humidity, precipitation, winds, clouds, and electrical conditions; and, second, to the hand of man; i. e., to the operations of the lumberman and husbandman in the destruction or production, as the case may be, of honey-producing flora.

Kenmore, N. Y.

To be continued.

GIVING INDOOR FLIGHTS TO BEES DURING THE WINTER.

BY G. T. WHITTEN.

On Dec. 16 I transferred a strong colony from a ten-frame hive into an eight-frame glass hive, the change being made out of doors, the temperature 34°. The bees were all in the new hive in about 20 minutes, when they were taken inside and placed in a south window in a cold room, and given a flying-cage two feet square, the hive entering the cage at the back, with an entrance out of doors through the cage.

Feb. 19 they were moved into a warm room and given a flying-cage the same as before. The temperature of the room was from 60 to 70°.

March 4 the hive was placed on top of a new circular hive. The bottom-board was removed to give the bees a free passage down through the lower hive and out into the cage.

March 12 the bees with the queen were all smoked down into the lower hive, and the top hive removed. They were then given a frame of honey from the original hive, this being placed in the cage. They at once made themselves at home and began building comb, filling it with honey from the frame. This hive is made on the plan of a half-circle, with glass on all sides.

The frames are of standard size, and are placed long side up, and so arranged that they can be turned around in such a way that each frame stands at right angles to the next one, thus giving an opportunity to see every movement of the bees on the frames. The frames contained only foundation of different dimensions, from none to full sheets. They are now, March 23, working on six frames, and have them well filled.

The second day they prepared a brood-nest, and the queen commenced to lay, and continues to do so. The frames are opened from once to many times each day for inspection. This does not appear to disturb

the bees in their work. They are looked over each night, a careful examination is made, and a record is kept of the changes during the day.

The bees are hybrid, very black. When outside they were very cross; but since being inside they have become gentle, and can be handled almost as safely as flies. They appear to enjoy being on exhibition.

The hive, with the brood and stores from which the bees were transferred, was taken to another room, and given to a single-frame colony that has been kept in a warm room since June 14, 1908. The frames were spread apart, and the frame with its bees and brood placed in the center of the brood-nest. The changes have been very successful.

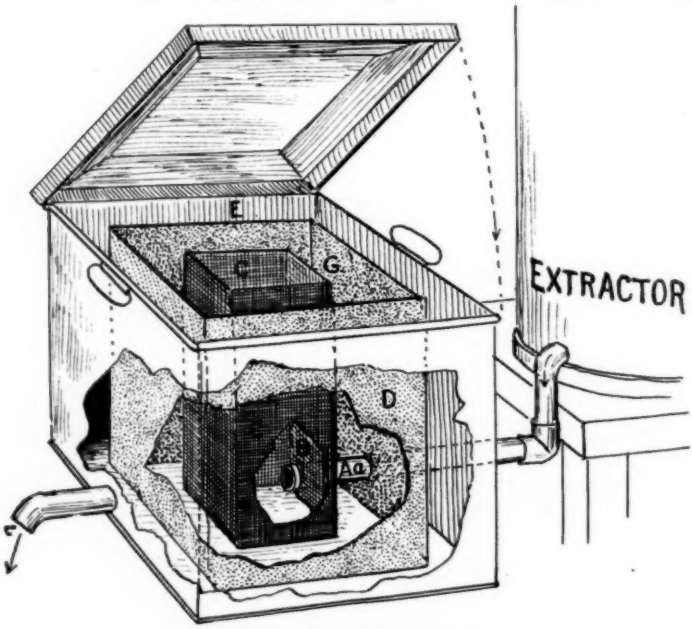
Hartford, Conn., School of Horticulture.

A NEW HONEY-STRAINER.

A Combination of Two Vertical Straining Surfaces which will Handle the Honey as Fast as it Runs from the Extractor.

BY R. F. HOLTERMANN.

Some years ago I described a strainer which I had been using for some time—one which was built in the extractor. This acted automatically, the honey flowing through it as fast as extracted, before it had a chance to cool. During the process the honey was not lowered below the honey-gate of the extractor, and it did not need to be lifted up later by main strength. The honey flowed in an unbroken lateral flow, so there was not the objectionable admixture of air-bubbles which produce the froth and scum, on which there is so much debate. Such troubles have been practically unknown to me since adopting this method of straining my honey.



HOLTERMANN'S NEW STRAINER.

Since the publication of my first plan, p. 146, Feb. 1, 1906, others in the United States, and even in Europe, have used it. The great drawback preventing its general adoption, however, was the fact that the strainer was attached to the inside of the extractor, and could not well be attached to an extractor already in use, as a special construction was required. To overcome this objection I have devised a new form of strainer, retaining all the principles of the previous machine, with the addition of a second strainer; that is, there are now two strainers—a coarse one and a fine one, the coarser one relieving the finer from clogging. The pressure and straining surface are increased in proportion to the depth of the honey in the extractor.

As shown in the illustration, the honey, after being thrown from the combs, strikes the side of the extractor and runs down to the honey level in the extractor below the reel. From there it flows out through the gate or through a special opening into the strainer-tube, which is connected with the strainer by means of a rubber hose. The honey then, by means of a 2½-inch-square tube, Aa, flows into the central compartment of the strainer B. Here, partly by means of gravitation, as in the former construction, and also by means of the wire cloth, twelve meshes to the inch (strainer C), the coarser particles are separated from the honey, which, in its outward course, then reaches the finer strainer, D, which is cloth supported by coarse wire cloth, like that used for the comb-pockets of extractors. Through this cloth it flows into the outside space, E, and from thence through the opening F, into the barrel or other container.

The cloth strainer, D, has a capacity of 1700 square inches. Most of the larger particles in the honey, owing to gravitation, never touch the cloth, because they are retained in the central compartment; and the bulk of those remaining rise to the surface of the honey and find their resting-place, not on the side of the cloth, but on the bottom of the can. Let me say, however, that, unless

the honey is passed through the strainer at a much slower rate than is practical, I would not consider it safe to depend upon gravitation alone, for even water will carry along its course particles which, by the law of gravitation alone, should sink to the bottom or rise to the top; and a thick substance liek honey has a much greater tendency to carry with it such particles.

The coarse wire strainer has four sides, 9 inches in width by 24 inches high. This is as coarse as will answer the purpose. The cheese-cloth strainer also has four sides 18 inches in width by 24 inches high. If the space under the baskets of an extractor is of a less depth than the straining-can, the entire surface of the strainer can be secured by lowering the bottom of the strainer below the bottom of the extractor.

If the weather is cold, or if the honey has been allowed to cool in the combs, the rapidity of the straining can be hastened by means of an oil-stove underneath; but the above system strains the honey under the best possible conditions without artificial heat, and I have rarely found the heat necessary.

The strainers can be removed from the can, as they are secured to the bottom by means of corner posts and cotter pins. The cheese-cloth is passed under the wire-cloth form upon which it is stretched. There is a valve by means of which the openings A and F can be closed at will. The valves are constructed in a manner similar to ordinary screw-cap honey-gates, and are operated by means of handles extending up to the top of the can.

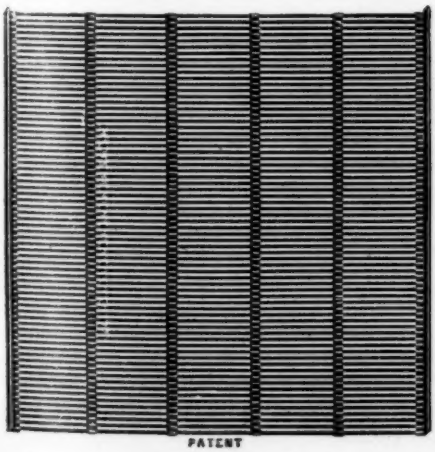
Brantford, Ontario, Canada.

WIRE QUEEN-EXCLUDERS IN ENGLAND.

BY JOSEPH TINSLEY.

I am sending particulars of some novel inventions by a bee-keeper in this part of the country—a particular friend of mine, Mr. Arthur H. Wilkes. I will first mention

THE FREE-WAY QUEEN-EXCLUDER.



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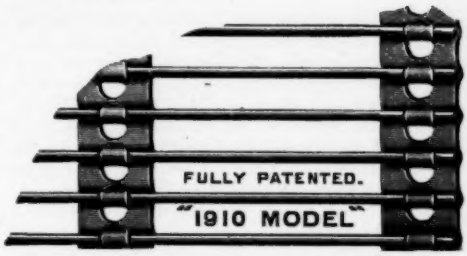


This excellent appliance is made from special hard-drawn round wire that *will not rust*, and is much in advance of the zinc one. The inventor claims the following points; and from my own personal experience I can endorse his opinions:

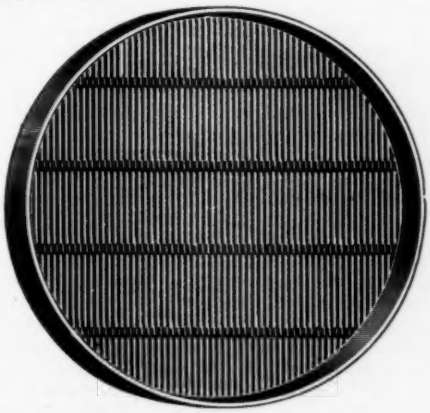
Twelve hundred bees can pass through at one time in a ten-frame hive, ⅞-inch top-bars, as against 800 with the zinc excluder.

It presents a smooth rounded surface to the bee, instead of a knife-edge.

It will will not buckle, and there are no flat surfaces to be sealed down.

The five ribbed strips, $\frac{5}{16}$ in. wide, rest on the top-bars of the frames, from end to end.

The bees pass through with scarcely any hindrance at all, which is invaluable to queen-excluders. It checks swarming to a great extent.



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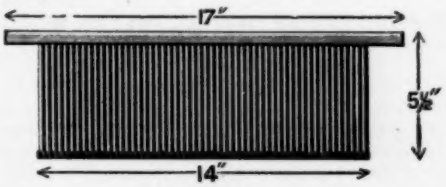
QUEEN AND DRONE RIDDLES.

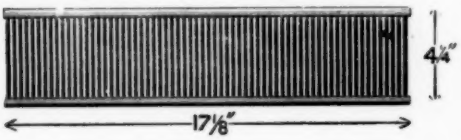
These are very useful in driving or shaking bees from their combs. They can be put to many useful purposes in the apiary. It allows workers to pass through, leaving the queen and drones to be disposed of as desired.



PATENT

FRAME-DIVIDER.

A simple appliance for insuring heavy frames of honey having flat and even surfaces either side. Bee-keepers know the time saved in uncapping honey when the combs are built evenly. By using this appliance the work is performed in half the time, and reduces waste to a minimum, as the cappings may then be shaved off in one complete piece. Frames of honey built by the aid of this ingenious appliance present a most attractive and splendid appearance for exhibition at shows or shop windows.



PATENT
WIRE SECTION-SEPARATOR.

The great point in favor of this class of separator is that it allows the bees plenty of space to work, and gives free access to the sections. Being non-rusting it will last for years.

Stone, Staffs., England, Jan. 20.

[This is certainly a novel way of constructing wire queen-excluders; but in our opinion the plan is defective in one respect. For instance, in the sample sent us the wires are held only approximately the same distance apart, the spaces varying from about 164 thousandths to more than 175 thousandths. A good many queens would certainly get through a space as wide as the last mentioned. Wire excluders as made in this country vary scarcely 2 thousandths of an inch — 163 thousandths being the standard.

The trouble with this method of making wire excluders will be understood by referring to illustration at the top of the right-hand column on the previous page. The spurs punched out of the solid metal, when folded over the bars of wires, are not folded over alike, making the spacing unequal. This may be due to different temper or thickness of the metal, or to defect in the dies. In the second place, the wires are altogether too small in gauge. They should be much heavier. The same principle, patented in this country, is much better, because the wires are made of thicker gauge, and held apart by molten metal poured around them at certain intervals.—ED.]

HOW TO FEED ARTIFICIAL POLLEN WITHOUT EXCITING THE BEES.

BY JOSEPH GRAY.

F. Dundas Todd, p. 122, Feb. 15, touches a subject of intense interest. It involves a far wider question than pollen feeding, which, to me, is one of the simplest matters of apiculture, and I was somewhat surprised to see his failure in hunting up the matter.

A close observer will not be long in discovering that the bees store their pollen in the comb next to the brood, and it is a big mistake to remove such combs in spring-time; if, then, our colony is short of pollen this is the place to give it; and so simple is the method that I thought it was a well-understood detail of bee-life. What I do is to take out the comb next the brood, dredge it well with meal, not fine flour, and replace it. By this method the bees are not unnecessarily excited, which is the one thing to avoid in unsuitable weather.

We all know the brood-nest advances slowly at first, and, if a queen is short of bees, to cover her work she will cross and recross, laying as many as five and six eggs in the same cell rather than go outside the cluster of bees. Old combs add to the warmth of the brood-nest, and usually contain pollen store, and are, therefore, of great value in the early spring.

The real reason so little is said on pollen feeding is that a district short of early pollen is the exception, not the rule. You can not force nature so early; wait till the crocus and willow are in bloom; and after the brood-nests are well going you can force on the strongest first, and make them feeders for the weak ones.

WHY CAN WE NOT FORCE EARLY?

Flight in unsuitable weather brings disaster to our little aviators; a chilling blast, a broken wing, means death to the busy worker; so the using of pollen, which means a larger amount of fæces to void on the wing and the bringing-in of water to prepare the milk food for the brood progresses only with the progress of the outside conditions; as these advance in warmth and sunlight, so the brood-nest advances; and as it advances, then and not till then can we force the pace. It is not profitable before, for the loss in bee life is not compensated for by the amount of brood raised. Never use a method of giving early pollen by which the bees are compelled to take it, because if they use more pollen they must fly more to rid themselves of the extra fæces.

Brood-nests advance in spring in proportion to the number of bees composing the stock. A weak stock may be headed by an extra fine queen, but not enough bees to cover her work. I have counted in one case cell after cell with ten eggs in each cell, and in some cases two larvæ in a cell. Keep such stock until you have built the strong stocks; then on a *flying day carry sealed brood and nurse bees*, and strengthen and equalize the apiary.

Never give brood alone to a weak stock; if it could have cared for more brood the queen would have seen to that. Far wiser is it to take one comb of brood and nurse-bees to a weak stock than two combs of brood which are liable to get chilled instead of strengthening the stock.

Dumbarton Road, Glasgow.

[See answer to D. M. Macdonald on page 271.—ED.]

Heads of Grain
from Different Fields

WHITE CLOVER CAUSING BLOAT IN CATTLE.

MOSQUITOES LARGELY TO BLAME; SALT PORK RELIEVES BLOATING.

I seed a fresh pasture each year. I have sowed for pasture a mixture of timothy and mammoth red clover; timothy and red clover; timothy and a mixture of red and alsike clover. The past year, my pasture being of timothy, alsike, and red clover mixed, the alsike seemed to occupy the ground entirely, and the bloom period lasted for a long time. The pasture looked beautiful, like large pink snowbanks. The milk supply was larger than when I pastured on either of the other clovers; but I was troubled much more with bloat than during the previous seasons, when I pastured on mammoth red and common red clover. Of course, the alsike was of a much heavier nature. This is how I account for the larger milk supply, and also more bloat. I think the large stems of the mammoth helped to a great extent to prevent bloat. Likewise, if white clover makes sufficient growth it will produce bloat.

Clover, at least with me, is not the only cause of trouble. Cows will not bloat if allowed to fill themselves with other grasses before going on the clover. Then, even though they are kept there, there will be no trouble unless in some way they are prevented from eating. This is where my trouble lies: The mosquitoes, at times, when the weather is wet, are very bad. The cows are hungry in the morning, after a long night's fight; and when the sun rises the mosquitoes quit their work, and the cows go to eating voraciously; and then it is not long before I have a case of bloat. I have never lost a case so far. I get a chunk of salt fat pork and shove it down into the mouth of the cow as far as possible, and at the same time hold up the cow's head by putting my other arm up over the neck and down under her jaw. I lift up to prevent her dropping the fat pork. She will chew for a while, and soon swallow. This will relieve the case at once.

I wrote to the Minnesota Experiment Station, asking if they knew of any thing I could spray my cows with to prevent the mosquitoes from tormenting them; but in reply they said they knew of nothing but kerosene. I did not place much confidence in that. I think that, if we had something in the form of grease, or something to spray the cows with, our bloat trouble would almost be at an end.

Medford, Minn., March 7. J. F. BRADY, JR.

A JACK-KNIFE OPERATION TO RELIEVE BLOATING.

I have raised considerable alsike, both for hay and pasture. I always let cattle out both night and day so as to prevent them from getting too hungry. I have had bloat but once, and the circumstances were these: A wet spring caused a very rank growth of alsike; and one hot morning about the first of June, when the alsike was five or six inches high, the cows, for some reason, stayed in the yard until about 9 o'clock, and, I think, drank quite heartily just before going out. In about an hour they came in again. Two were bloated—one old cow very badly, and a young one not so much. An old man had told me once to put a large wooden bit in the animal's mouth, and the efforts to dislodge the bit would enable the gas to escape. I tried that first on the old cow, but it did no good, and in the few minutes I was working with her she was rapidly getting worse. I had no trocar and cannula; but I thought she would die if I left her alone long; so I pulled out my jack-knife with a sharp-pointed blade about ⅜ inch wide, and, holding the blade very firmly between the thumb and first finger, letting it project about an inch, I jammed it through the hide up to my fingers, on the left side, half way between the hip bone and the first rib. I found it necessary to put something in the way of a tube in the hole, as it will close when the animal moves, as the inner linings will move over the hole in the skin. So I put in a piece of quill from a large feather, and in a short time the old cow was almost as well as ever. I noticed, however, she showed the effects for a week or ten days, after which she was all right, and I owned her and pastured her in the same field for several years.

While I was operating on the old cow, the young one that was not bloated so much began to go down, and recovered without any treatment.

I regard alsike as a much superior feed to white clover, and I should not worry over the bloating, with this precaution: Never let cattle get very hungry and then fill up on a rank growth of succulent feed like alsike, and especially if it is wet with dew or rain. As Mr. Goddard says, "When cattle eat heavily of any succulent crop they are subject to bloat."

Dunlap, Ia. E. S. MILES.

WHITE CLOVER CAUSES BLOATING WHEN IT GROWS VERY RANK.

About 1878 to 1886 it was a common thing for the cows to become bloated on white clover in and around Wyandot, Kansas, where I then lived—that is, the cows that were turned loose on the commons in our little town. Many cows died from it. The clover was very rank, some years being nearly knee-high in many places. When the dew was very heavy I used to keep my cows up in the morning until the clover was dried off. I have put a gag in the mouths of two or three cows until they would belch the gas out.

Escondido, Cal., Feb. 24. J. A. NELSON.

FEED HAY BEFORE TURNING ON TO CLOVER.

I think the cases of bloating from alsike or white clover are very scarce, but from red clover, very frequent. Bloating might take place from the small clovers if there were a large growth, and hungry cattle turned on when the clover is wet or frosted. The best way to avoid bloating is to turn cattle on when the grass is dry, or for only a short time, say two hours; then drive them off for the day. In all cases of that kind it is better to give cattle a good feed of hay; then when the grass is dry they will not overload their stomachs.

Easton, Md., March 10. J. AIKENHEAD.

ANY CLOVER MAY BLOAT CATTLE.

All clover will bloat cattle when they are turned out on it before the dew dries off. I have never lost any stock from that cause, but I have had some swell up until they were ready to burst. My remedy is a teacupful of epsom salts and a tablespoonful of ginger put into a bottle afterward filled with water. Shake well and drench, and watch the cow chew, as if chewing the cud. When she is done she will be the poorest-looking skeleton you have seen for some time. Where the flesh goes to I can not tell.

Marshallton, Pa., Feb. 22. W. W. WEBSTER.

A SHORT PIECE OF GAS-PIPE INSERTED AS A BIT ALLOWS THE GAS TO ESCAPE.

White clover does cause bloat. We have had experience with that and red-clover bloat. In 1908 white clover was abundant, and we had considerable trouble. To cure bloat, take a short piece of gas-pipe and drill a few holes through it and place it crosswise in the animal's mouth like a bridle-bit, and, nine times out of ten, the animal will soon be relieved. For those who have no gas-pipe, a hollow stick of wood about the size of a broom-handle, with holes bored through, and fastened in the animal's mouth, will do. This allows the gas to escape out through the tube, and prevents the animal from swallowing it again.

Blue Mound, Ill., Feb. 21. M. C. MORGAN.

DISTANCE BEES FLY FOR NECTAR.

In this locality my experience says most emphatically that the great bulk of the honey is gathered within one mile of the hive. In one small yard of 25 colonies, only two miles away, the bees during the past summer gathered quite a little surplus at a time when those at the home yard were doing nothing, and they brought in a different kind of honey from any ever gathered at home. Then at the time of heartsease bloom they did not gather as much as the home bees, although they were apparently near more heartsease than those at the home yard. Then, again, a yard three miles from home, and within half a mile from large fields of heartsease, stored several times as much per colony as the home yard, which was from 1¼ to 1½ to the same fields. The home bees nearly all flew in the direc-

tion of this heartsease, which was along an overflowed creek-bottom; but they did not seem to get much. Another thing I noticed, the bees that were near the heartsease-field bred stronger in the fall, and were much stronger in bees than those that were further away. It seemed as though the latter knew their forage was far away and hard to get, and they filled up the brood-chamber heavier than the others, and that, of course, cut down the surplus somewhat. The country they have to go over is not very rough—just one large hill, then a straight shoot of about a mile to the bottoms.

Dunlap, Ia. E. S. MILES.

TWO RECIPES FOR USING HONEY.

For honey candy take one cupful of butter, two of granulated sugar, two of honey. Select a deep preserving-kettle and put in the butter, first rubbing it well over the bottom of the kettle; then add the honey and sugar. Let it boil fast for ten minutes. Ascertain if it is done, in the following way: Have ready a cup of cold water, and drop a little into it from the point of a knife. If it is sufficiently done when you take it from the water it will be crisp. Now prepare a large shallow tin or pan; rub over with butter to prevent its adhering; pour from the kettle to get cold. To keep good it should be excluded from the air.

BROWN BREAD.

Three cups of graham flour; ⅔ cup of honey; 1 pint sour or sweet milk; ½ cup raisins; 1 teaspoonful each of soda and salt. Grease three 1-lb. baking-powder cans and fill with the mixture.

Tempe, Ariz. W. W. APPLEBY.

[We have tried both of the above recipes and can vouch for their excellence, the brown bread being especially good. The candy is like the old-fashioned "butter-scotch," but better.

Honey is not used as much as it should be in cooking. It is not as cheap as some of the inferior "corn syrup, but it is not in the glucose class. Honey is *sweet*, and the so-called corn syrups are but slightly so except for the addition of the 10 per cent of cane flavor. The 90 per cent (glucose) is about half as sweet as sugar.

Dr. Miller and others have given some very good recipes using honey, but there ought to be many more. Our columns are open. Let those who know of good recipes using honey send them in to us. We shall be glad to use them for the benefit of all.—ED.]

WHAT IS THE LIFE OF A WORKER?

I have just read Dr. Miller's Straw and your comment in regard to the length of the life of a worker-bee, in which the doctor figures, and you agree with him, that the average life under normal conditions is 6 weeks or 42 days. How this piece of foolishness ever got into bee literature is more than I can comprehend. Not only is the average of the bee's life not 42 days, but the very limit of bee life under normal conditions does not exceed 27 days.

Some years ago I lost heavily in winter, so the next spring I sent to Florida and bought 50 queens. As these were very yellow, and as I used hybrids to form my nuclei, it was easy to see when the new bees began to hatch out, and to see when the last of the old bees were gone. Now for the results: As these nuclei all contained freshly laid eggs it was just 21 days when the last hybrid bees were hatched out. In 27 days more, not one of the hybrid bees was left in the 50 nuclei. Now, if every hybrid bee was gone in 27 days after it hatched, how can you make out the average life of the worker 42 days? I think it is time this inexcusable blunder in bee literature was corrected.

I have been with the bees for forty years; and my observation is that, when the bee begins work in the field, its days are numbered. Of course, bees thrown out of normal condition will live for several months. You may figure from the time the egg is laid; but even then the limit of bee life would be 48 days; but you can not do this fairly, any more than you can figure the life of a chicken from the time the egg was laid, or your own life from the time you were conceived.

Hop Bottom, Pa., March 8. G. A. WRIGHT.

[A good deal depends on what you mean by "normal conditions" and "average life" when we figure on the number of days that bees will live. Then we must also take into consideration the strain of bees and the source of nectar. "Normal conditions" we would consider to mean the entire season—beginning, say, the first of May, and ending along in September or October. A heavy honey-flow, especially from some sources of supply, would mean an abnormal condition. When we speak of the "average life" of the bee we may refer to the life during the honey-flow, but generally mean length of days through the entire season.

You are basing your observations on one season's experimenting. In drawing conclusions, one experiment could hardly be considered as conclusive. You say nothing about the kind of honey-flow that was on at the time, nor do you say whether the nuclei in question contained the proper proportions of nurse bees and fielders.

Years ago, when we were Italianizing our apiary, we had an excellent opportunity for observation. We found that, during the height of the honey-flow, the life of the average worker was from four to six weeks—that is, the ordinary *black* bee. When we Italianized after the honey-flow there were black bees in the hive—large numbers of them—throughout the entire late summer and fall. In some instances the black fellows showed up all winter, but these were exceedingly rare. We remember that the results we secured were quite in line with reported observations of some of the eminent investigators of years ago. On the other hand, we have had reports of where the workers lived only two or three weeks. In that case the bees had to work on sources of nectar supply where it was very difficult to get the coveted portion of nectar. Some flowers are of such construction that the bees have to do a great amount of crowding and straining to get down to where the nectar is. In that case the wear on the wings is excessive. The life of the bee depends very largely on the wings. If the wings are worn or frayed out, the whole bee will be out of commission. We have almost a parallel case in the horse. He will be able to do good service so long as his *teeth* hold out; but when they fail him, so he can not masticate his food properly, he is soon good for nothing. We shall be glad to hear from others on the question.—ED.]

PUTTING FRESH BEES ON COMBS ON WHICH OTHER BEES HAVE DIED.

A lot of my bees died this winter and I have a lot of old combs filled with bad honey which is candied or granulated. I have no extractor. Would you tell me how to get it out of the comb? Can I feed the honey back to the bees when they are raising young bees, as the honey is soured and the comb is moldy?

Tidal, Pa. JOHN A. WOLFE.

[There is no trouble about putting bees on to combs from which other bees have died, providing the stores have not soured. If they are sweet, even though candied, the bees will use them providing they can get access to water. If the honey is actually soured, there is not much you can do with it except to soak the combs in warm water, extract the candied honey partially soured, then work it over into honey vinegar. If the combs are undesirable in other respects we would advise putting them through a wax-extractor. The melted wax will be on top of the soured honey. When the wax cools, the honey can be drawn off and thinned down with water and made over into honey vinegar.—ED.]

CAN THE PRODUCTION OF WAX BE MADE PROFITABLE? THE SIMPLEST AND EASIEST WAY TO INTRODUCE.

1. How would you manage a large colony during a season to secure the largest production of wax from it, instead of honey or increase?

2. What do you consider the safest way to introduce one dozen queens to hybrid colonies during apple bloom?

Crawfordsville, Ind., March 12. W. H. KERR.

[1. Wax production can not be made profitable in any except tropical countries. Certainly it could not be made to pay in Indiana or any of our Northern States. Even in Cuba, with its long honey-flows, Mr. C. F. Hochstein, a resident of the island, and one who has tested the proposition, says that honey at even one cent a pound is more profitable than wax at 30 cents. On the other hand, wax production on some of the Hawaiian islands is fairly profitable; but the conditions there are much more favorable than in Cuba or in any of our Southern States. In Hawaii, combs are built from mere starters. The honey is extracted, and the combs

melted up in a special steam and hot-water wax-machine. It is possibly true that a large-sized solar wax-extractor might be employed for this business to advantage; but if we are correct they are not used in Hawaii.

2. We know of no better way for the average person to introduce a queen than to use some good introducing-cage so constructed that the bees can release her automatically by eating out a plug of candy. There are other methods that are good; but this we consider the simplest and quickest to apply.—ED.]

WHY IS THE PARENT COLONY LAZY?

We all know that, when a colony swarms, the old queen leaves the old hive, where a new queen hatches, with the larger portion of the worker bees; then a period of depression reigns in the old hive for quite a long time in some cases, and with the frequent result that the new stand in the old hive does not gather very much, if any, more than they are apt to need for winter stores. It appears to take them the rest of the season to recuperate from the effects of the leaving of the old bees. Now, may we not counteract this condition, and cause the parent colony and young bees to store nearly if not altogether as much as the old bees with the old queen, although the old bees and queen store sufficient for themselves and our money-making surplus so much talked of. How is it that a new queen and new bees, with hundreds hatching every minute, can not do nearly as well as the old and almost worn-out colony? Is it possible that the very act of swarming so depletes the vitality of the colony as to necessitate the rest of the season to recover from the effects of the same?

Chadron, Neb., Feb. 8. LEE CARD.

[There are two or three reasons why the parent colony does not equal the performance of the swarm itself. First, by the time the young hatching bees are *old* enough to gather honey the honey season in most localities is over. Second, the parent colony has given all its working force and many of its young bees to the swarm; and even if all brood of the parent colony had hatched, and the bees from this brood were old enough to go to the fields, its force would be light in comparison with the force in the swarm. There may be a virgin in the hive at the time the swarm is cast, and there may be only ripe cells. At best there will not be a *laying* queen for a week. There will be, therefore, a gap of seven or eight days in brood-rearing, while brood-rearing will commence in one or two days in the swarm. The latter, from every point of view, has all the advantage.—ED.]

ANOTHER CASE WHERE PART OF A LOT OF HONEY SOURED.

On p. 744, Dec. 1, mention is made of part of some honey that soured while the rest did not. I had the same experience, only my honey was three years old before it showed any signs of souring. Out of ten cases there were only four that did not sour. It was old honey that I had taken out in the spring to give the bees room. It was strained into a 1500-lb. tank, and then drawn off into 60-lb. cans. It stood in my shop, where it was good and dry; so last spring I thought I would ship it and get something out of it, as it was very dark, and what we call tarweed honey. It was very strong. When I opened the cans of honey they spewed right out; others were all right. I tasted it, but it did not taste sour. I could not think what was the matter with it, so I sent it to San Francisco. The commission man kept it about eight months, and then wrote me he could not sell it; so I paid the freight both ways, and am going to feed it to my bees. Do you think it will hurt them?

Arroyo Grande, Cal., Dec. 1. M. D. PRICE.

[We would not advise feeding any soured honey to bees under any conditions. Soured honey is good for nothing except to make into vinegar. If the honey is only very slightly sour, bring it to the boiling-point to prevent further fermentation, and give it to bees in spring or summer for brood-rearing. We would not give it in the fall.—ED.]

FEEDING POLLEN INSIDE THE HIVE IN SCOTLAND.

I was interested in your reminiscences of the days of auld lang syne in your reply to Mr. F. Dundas Todd, p. 123, Feb. 15, on the question of feeding pollen in hives. We practice three separate plans in this country, although, as a rule, the pollen supply comes early enough to set the bees breeding. The large majority of British bee-keepers are engaged in the pursuit on only a small scale—indeed, with most it is more of an avocation than a vocation; hence, as with most hobbies, it takes up an undue proportion of their time; and as soon as spring appears they must be stimulating. To meet the want, several of our appliance dealers list a special feeder, with an apartment for pollen as well as one for syrup. The bees can, therefore, get a supply of nitrogenous as well as non-nitrogenous food inside the hive in early spring. Then they advertise candy cakes, of one or several pounds, made from sugar or sugar and honey. Into this preparation, before it sets, they stir a quantity of common flour, rye meal, or pea flour, as a substitute for pollen. Indeed, a very considerable trade is carried on in this line every spring.

A rough-and-ready but very effective plan is to make a thin paste of pea flour and honey. Work it well and press it down into the cells of a tough worker comb. Place this comb next to the cluster, flat above the frames, or lying on the floor-board if there is a deep bottom space. Bees can then start breeding with a full supply near at hand. As, however, water is an utter necessity when brood is being reared, and bees must fly for it, it is questionable whether all this stimulation does much to advance the prosperity of the colony unless in an emergency.

Ballindollock, Scotland. D. M. MACDONALD.

[The fact that bees need water in brood-rearing makes it advisable, when giving artificial pollen, to feed it *outside;* that is, make the bees *fly* for it. If they then can get at the meal they can also get water. For this reason we have discouraged giving nitrogenous food in the hive, mixed either with candy or syrup.—ED.]

YELLOW SWEET CLOVER.

Will you please tell me how and when yellow sweet clover should be sown? also the amount per acre. Will it make good hay, or is it to be used only to plow down for fertilizer? Will it grow on wet soil?

Albion, Pa. W. H. KLINGENSMITH.

[Yellow sweet clover should be handled the same as the white. We have been in the habit of recommending sowing the seed in about the same way, at the same time, as common clovers. It may be sown with any kind of grain; and if it does not come up right away it will later—that is, if conditions are favorable.

No one ever needs to be afraid of any of the sweet clovers being noxious weeds. They will readily yield to the plow. Plow under as you would common clover, and for the same purpose, and there will be no more of it in that field except, perhaps, around the fence-corners or in waste places.—ED.]

RAISING QUEENS OVER STRONG COLONIES OR IN NUCLEI.

I know the latest system of raising queens and am able to produce them successfully. If I form a nucleus over a strong colony with *wire* cloth between the colony and the nucleus and get a queen fertilized and laying in the nucleus, and then kill the queen in the old colony and remove the wire cloth, will the new queen in the nucleus be accepted by the bees in the old colony? Is this a safe way to requeen? Or would it be better to raise the new queen in a nucleus and introduce her from a cage with candy, the orthodox way?

Mount Airy, N. C. J. E. JOHNSON.

[Your plan will work, but we would not advise raising queens on this plan. Generally speaking, after the cell-building stage queens should be raised in nuclei on separate stands.—ED.]

FOUNDATION TEN YEARS OLD STILL PLIABLE.

I have just been using some Weed foundation I bought of you in 1900. It is as soft and pliable as the day it was made, and as tough as parchment. I see no reason why it should not be as good after fifty years as it is now.

Fernhill, N. Z., Jan. 3. O. R. BOSTOCK.

[This is contrary to the lately expressed opinion that foundation should always be fresh. It would be interesting to know whether the bees were able to draw it out as easily as they would the fresh.—ED.]

A LARD-PRESS FOR RENDERING WAX.

Having some wax to render last spring I soaked my combs well in water and heated them up to the proper temperature. I arranged an Enterprise sausage-stuffer and lard-press as for lard-pressing; and, having made a sack of good burlap of a size a little larger than the inside of the press I dipped my melted comb and wax into it and pressed it as dry as I could; then I took the sack out and put it back in the water and melted the wax. I took the top of the sack in one hand, and with a stick in the other I punched and stirred the sack until it was all softened up again, then I put it back and pressed it again and got the wax out in fine shape, as good, apparently, as a wax-press would have done. The lard-press is something that almost every one has, and it does not hurt the press, and saves buying a wax-press.

Dayton, Va. S. H. BLOSSER.

[There is no question that you can render wax in a lard-press; but unless you repeated the alternate heatings and pressings a number of times you would be sure to lose some wax in the slumgum. Unless you had a small amount of comb to render, you would probably find that you would lose enough in a short time to pay for a good press adapted for pressing combs.

When you wish to heat up the contents of the sack again, dip off the layer of wax on top of the water, else the slumgum will quickly absorb some of it, making it necessary to do that much of the work over again.—ED.]

WERE THE DRONES WINTERED OVER?

I noticed one of my colonies, a strong one, in normal condition, that had drones flying which must have wintered over. I watched to see if they were kindly received upon reëntering the hive. This they were. A wasp trying to enter the hive was given a warm reception.

I introduced alsike clover in this locality, with the result that it gets sown more and more every year. I have been thinking of sowing sweet clover along the railroad-tracks. What variety would you advise me to sow? Several years ago I sowed a small end of it to the yellow kind, and a little of it to the white. The white always gets mown off before it gets in bloom; but the yellow does not. I would rather sow the white, so as to have something for the bees when grapes and peaches ripen; but I am afraid it will get mown down before it gets to blooming, on account of its tall growth. H. STOCK.

Augusta, Missouri.

[Drone brood will sometimes be reared in late winter or very early spring. This is particularly so if the queen is old or failing. These early-hatched drones are quite apt to give the impression that they had been in the hive all winter.

We had one hive in our north yard that had quite a bunch of young drones by the first of March. One might easily suppose that they wintered over, just as you did. Of the two sweet clovers, the white is superior, and the yellow hard to get. You can sow sweet clover along the railroad banks; but you had better get permission from the company. Public sentiment (based, of course, on ignorance) would be against sowing sweet clover in waste places; but the public is being educated through progressive farm papers that now know that the plant is not a weed but a valuable forage-plant. It is a great soil-binder for railroad embankments, and it won't be long before these great thoroughfares will sow the seed themselves for the protection of their property. When farmers, too, welcome it we shall expect a greatly increased source of honey. May the day speedily come.—ED.]

STINGING NOT FATAL TO CATTLE.

On p. 199 Mr. J. F. Sempers inquires about bees stinging stock, and then the stock died. If that is the case I should have some terrible damages to pay. I live in quite a dairy district. Last season I wintered 130 colonies here. When the warm days came on, bees went in search of pollen, and they got into the dairymen's gluten-feed bins, and then into the feed-troughs. The cows would cough and gag and kick, so the men could not milk the cows till the bees quit flying. If it would kill stock, there certainly would have been some dead. The bees became so troublesome that we moved some of them. This spring it is not so bad.

Fair Oaks, Ind., March 22. HENRY ROORDA.

BIND YOUR JOURNALS.

Mr. Todd's account of his unsuccessful hunt through the bee-books for something on flour candy, and the editor's reference to old volumes of GLEANINGS, lead me to describe my practice. While there is nothing new in the idea of binding magazines, it is not generally practiced among bee-keepers. I find that the journals stored away in the closet are seldom referred to, while those nicely bound and placed on the shelves are in frequent demand. One year's issue of GLEANINGS makes a large book. We get it bound in serviceable half-leather for one dollar, and a single volume is worth two or three ordinary books on bee culture for reference. Eight or ten volumes of this kind will make an encyclopædia of bee lore that can not be equaled by all the well-known bee-books combined; and one has little idea of the frequency with which it will be used. In almost every issue there are valuable articles, not of present interest, that are lost entirely unless preserved in some permanent manner. The first cost of the journal is one dollar; and by adding another dollar to the cost we can increase the practical value not only twice over but many times as the value increases with the years.

Atlantic, Iowa. FRANK C. PELLET.

TO KEEP GRASS DOWN AROUND THE ENTRANCES.

The problem of keeping weeds and grass from growing in front of hives seems to be a vexing one with many bee-keepers. It really is very simple. One way is to use boiling water; but it takes a lot of it, and the hot steam in front of the hives fills the bees with the agony of helpless despair. A solution of arsenite of soda also would be effective; but poison, especially a mineral poison, should never be used for any purpose where something else is available.

Lay a strip of tarred building paper, such as has been recommended for wrapping around hives for winter protection, along on the ground in front of the hives, extending in under the alighting-boards, and weight the paper down with stones, bricks, sticks of firewood, or any other handy material. This to be done in the growing season of the weeds and grass, including two or three days of sunshiny weather. The paper can then be shifted along to some other place, and the operation repeated until the whole yard has been attended to. How many treatments might be necessary during a season I do not know, but certainly not very many.

Carthage, Mo. B. C. AUTEN.

MORE PROOF THAT BEES MOVE EGGS.

On page 780, Dec. 15, last year, Mr. Samuel Simmins doubts the ability of bees to move eggs. About the year 1882, one of my strong colonies lost a virgin queen; so a little later I cut out a square inch of comb with eggs to give to this colony. I laid this piece of comb near the entrance, intending to put it in the hive; but just then I had to go to dinner. After dinner I found all of the eggs gone out of this piece of comb. I did not see this colony again for more than a week, and then I looked to see if they had a queen, and I found two large queen-cells that were capped over. I was Italianizing at that time, and the eggs which I had given this black colony were from my first Italian bees. The resulting queen was an Italian. If Mr. Simmins will lay a piece of comb containing eggs against the entrance of a hive that has lost a virgin queen he will find that he can raise nice queens.

I intend to prepare a colony for queen-rearing, provide artificial cell-cups, etc., and, when the bees feel the need of a queen, place a frame of eggs that are one or two days old, flat on the bottom-board, and see if the bees won't do their own grafting. This frame must not be suspended or the bees will build cells on it. C. V. KINTNER.

Carrollton, Ohio.

WILL SULPHITE PAPER-MILLS INJURE BEES?

A sulphite paper-mill is being built here. Some say that the sulphur fumes will kill my bees. If it will kill them, tell me how far away I must move to be safe. I live 1½ miles from the mills now.

Ladysmith, Wis. JOHN ARMSTRONG.

[We have had no personal experience; but if you are 1½ miles away from the mills it would seem very unlikely that you would notice any great loss. If others, who are in a position to know, have reason to believe otherwise, we should be glad to hear from them.—ED.]

Our Homes

By A. I. ROOT

And out of the ground made the Lord God to grow every tree that is pleasant to the sight, and good for food; the tree of life also in the midst of the garden, and the tree of knowledge of good and evil.—GENESIS, 2:9.

And the Lord said unto Moses, Make thee a fiery serpent, and set it upon a pole; and it shall come to pass, that every one that is bitten, when he looketh upon it, shall live.—NUMBERS, 21:8.

Come unto me, all ye that labor and are heavy laden, and I will give you rest.

Take my yoke upon you, and learn of me; for I am meek and lowly in heart; and ye shall find rest unto your souls.

For my yoke is easy, and my burden is light.—MATT. 11:28, 29, 30.

If you have not recently read the second and third chapters of Genesis I should like to ask you to turn to them. Please read with care especially the third chapter. If, like myself, you are pretty well along in years, I think you will admit this is a wonderful story of the birth and childhood of the human race. No matter what your belief is, I think you will agree with me that it touches humanity as nothing else has ever touched our origin since the world began. When I was less than a dozen years old I overheard an ungodly man censuring God for having placed that "tree of life" in the very center of that garden, and then forbidding Adam to touch it. For over 50 years I have in my mind considered this thing: Why *did* our heavenly Father place there that tree "of the knowledge of good and evil," and then forbid Adam to go near it? Does not the story suggest humanity's struggle even now?

A little child, the baby, that is just learning to reach out its little fingers to explore things, notes how the mother says, "Burny, burn!" as it comes near the hot stove. Is it not so more or less, clear down to old age? A man, like a locomotive, would be useless unless strong steel rails kept him in the "straight and narrow path."

Adam deliberately broke God's holy law almost as soon as the law was laid down, and in so doing set an example of disobedience for the whole human race, and put the stamp of rebellion against proper authority on all his posterity, clear down to the present time. When Moses, by God's command, undertook to lead the people out of slavery and bondage into the promised land he found the "old Adam" rooted and grounded in the whole gang. They were a set of grumbling rebels; and one of their grievances was, they couldn't have the "flesh" and "onions and garlic" that they had when in captivity. The Bible doesn't really say so, but I shouldn't wonder if they complained because they couldn't have "three square meals a day;" but I expect to touch on this later on. Their "mutiny" finally got to be so great that God sent "fiery serpents" to discipline them. Right here we have one of the first examples of God's tender mercy and love for his rebellious children. In order to extend free pardon *instantly* to every penitent child he directed Moses to make and carry aloft the "brazen serpent" that every one who really was sorry for his rebellion might "look and *live*," as we have it in that beautiful hymn.

Well, friends, although you may not have thought of it, that brazen serpent is *still* up before us, and, "glory to God," we may even yet look and *live*.

Away down along the ages came one who was commissioned to issue an "emancipation proclamation," and who has the power and authority to "make good" his wonderful and precious invitation. Since the world began, just one, and *only* one, has been permitted to use these wonderful words, "Come unto me, all ye that labor and are heavy laden, and I will give you rest. Take my yoke upon you, and learn of me, for I am meek and lowly in heart; and ye shall find rest unto your souls. For my yoke is easy, and my burden is light."

Some of you may now object to the way I am going to use this beautiful and gracious text; but I feel sure the Holy Spirit is back of me when I try to tell you of the wonderful way in which many of you, at least, may find *emancipation* from your troubles.

The "yoke" Jesus mentions is the yoke of *self-sacrifice*. You must give up thinking of *self* so much. If you want your burdens to be *lighter* you must give up and forget selfish appetites and selfish notions. You must commence following in the footsteps of him who "pleased not himself."

With this long preface I am now almost ready for my especial message to *your own self*. Now, this is not for somebody else, mind you; it is for the one whose eyes rest on this printed page. The "revelation" came to me in this way:

I have just one brother living, who has been for about 20 years in Arizona. He has just done a most sensible thing in deciding to come down here to Florida and make us a visit. If you, my friend, have neglected for many years to visit your brothers and sisters, get right at it (before God takes you away) and see how much good you may do by so doing. Well, this brother is no taller than I am, and yet he weighs about 180 lbs., while I have seldom gone beyond 130. Several years ago he was in poor health, and had distressing night sweats. About three years ago he discovered that when he ate very light suppers this trouble was better; and finally, when he ate nothing at all after his noonday dinner, the sweats entirely disappeared. I believe that, about the same time, he took up having a sponge bath with cold water every morning. Isn't it funny that he, without knowing it, has adopted Terry, so far, almost to a dot—"*a cold bath every morning, and two meals a day*"? Simple, isn't it? Well, Mrs. Root has trouble about sleeping, more or less, and she tried "no supper." Very soon she decided she felt certainly as well, and perhaps a lit-

tle better, so the supper was prepared for me alone. Please excuse me here for taking a little space to say that for years I have been most of the time clear used up before every one of the three meals, and, most of all, when it comes "supper time" toward the close of the day. Mrs. Root has for years recognized that, unless I had some good nourishing food for supper, and a good sleep *after* supper (as well as before dinner), I could never hold out to attend to my letters and reading my periodicals during the evening. "Jess" (my brother) assured me several times, that, after just a few days, I would get all over feeling faint, and get through my evening's work *all the better;* but when, for some reason, my supper had been delayed, I had felt so faint and exhausted I could not think it possible. It is true, I had often read what Terry, the good friends at Battle Creek, Mich., Upton Sinclair, and others have said about two meals a day; but I could not scrape up faith to believe such a thing was possible for *me*. Well, Mrs. Root protests about my "rushing into print" before I have tried it longer; but I really feel as if I couldn't wait, without telling you I have now tried it several days; and, although it takes a little "self-denial" (about 5 o'clock every day) I feel very much better in every way without any food after our noonday meal. May God be praised for the "emancipation," not only for myself, but for the "dear wife" who has been tied down to the *slavery* (yes, that is the right word) of "getting supper" for a nervous used-up husband for almost *fifty years*. Through all her busy life she has objected to letting any thing or anybody "go hungry," and even now she worries some for fear *I* shall "go hungry" and not mention it because of making her trouble. Yes, I do sometimes feel a little hungry when I go to bed (about 10 P.M.), but in the morning I never feel hungry the least bit; in fact, I feel so *exceedingly* well that several times they had trouble in hunting me up (out among the chickens), and getting me to "come to breakfast."

Well, now, suppose you figure up how *many* tired women there are in this world of ours who would gladly be "emancipated," like Mrs. Root, from the slavery of supper-getting. It *may* prove a sort of "yoke" to some of us; but, O my friend and brother! you *will* find, if you go about it in the right spirit, that "my yoke is easy and my burden is light."

If Terry and I succeed in proving that suppers are superfluous (or worse), what shall we say of the evening socials and banquets? Who is the unwilling "slave" that provides all these expensive foods, and afterward washes and wipes the *wagonloads* of dishes? Is there a Moses coming *some time* or *somewhere* in the future to deliver us from the lash of the cruel driver and bring us into the "promised land," even a land flowing with milk and honey?

My brother has been, most of his life, proprietor of a drugstore. His son is a prominent physician with a good practice; but when he had stubborn night sweats, did he take the remedy from the great array on the shelves of his drugstore? I tell you, nay; he took a cold bath every morning, and ate nothing after the noonday meal.

Terry suggests that two meals a day gives the digestive apparatus a chance to rest up a little—a sort of "vacation." In my case I might almost say it has been the first real *vacation* in thirty or forty years, for I have had three good meals a day almost all my life. Omitting supper is a little different from the "no breakfast" plan; but I think it rather better. When you are ready to sleep, the stomach and bowels are or should be practically empty and at rest; and after you have had a big drink of pure water, when you first get up (*a la* Terry), your clean and washed-out system is ready to do good work with the breakfast. In fact, we might almost say there has been a sort of "cleaning house" and getting rid of all rubbish.

Mrs. Root suggests that, while no supper may be all right for grown people, especially elderly people like ourselves, it would hardly do for children and youth. This may be true. You know the "chicken books" tell us to feed the very young ones every two or three hours, etc. Well, our boy Huber, when at college, of his own accord got on to the no-breakfast plan and kept it up for years, and declared that, by so doing, he got on with his studies better. When in poor health he urged me to try it; but I declared all the time I was sure it would never answer for *me*. Perhaps some of you ask, "How about my apples" (the "best medicine in the world," you know)? Well, I didn't have my apples last night, and I feel so well this morning I think I will take my fruit hereafter at noon or shortly after dinner.

God told Adam (and Eve) not to touch the forbidden fruit, but their love for new things, and their low carnal appetites prompted them to listen to the serpent, and they fell as a consequence of disobedience. God is, in like manner, trying to tell us (if we would but listen) to beware about letting our love for "good things" prompt us to make a bad use of them. Some of us have already acquired unnatural and perverted appetites; but, may the Lord be praised, there is help even for such. "Take my yoke upon you," and you will *surely* find "my yoke is easy, and my burden is light."

HOME-MADE CRUSHED WHEAT.

Mr. A. I. Root.—I have just been reading what you say in GLEANINGS, Feb. 15th, about parched wheat for breakfast food. We have used it for several years, and I should like to tell you how we prepare it. We get two bushels of wheat in the fall, when it is first thrashed, and take it to the gristmill and have it run through the smutter so it is cleaned the same as they clean it before they grind it for flour. Then when we prepare it we take four or five quarts, or as much as we wish to grind at once, and wash it in two or three waters, and then put it in deep tins. Have the wheat about two inches deep in the tins, and put it in a warm (not too hot) oven and let it dry. Heating it when it is wet cooks it and roasts

it just enough to give it a good flavor; then we grind it in a hand mill and cook it in a double boil- the same as you would cook oatmeal. It is better than any food you can buy, besides being so much cheaper. I have tried to get my neighbors to use it. They all like it better than any thing else of the kind. Some have used it for awhile, but do not follow it up, because it is so much easier to buy something already prepared. This wheat prepared in this way is too hard to eat without cooking. I should like to have something of the kind I could eat dry; and one object in writing this letter is to ask you to have your people manufacture a machine (to use by hand) to crush wheat like the Pettijohn breakfast food. A pair of smooth foundation-rollers with a hopper on top to hold the wheat and let it run down on the rollers would do the work. The wheat could be soaked so it would crush easily, and dry after it has been run through the mill. If you would get up such a mill you could sell hundreds of them. It always seemed foolish to me for farmers to sell wheat for two cents a pound and then buy it back at ten to fifteen.

I am what you might call an old-timer. I started in the bee business about the time you did; read your writings in the *American Bee Journal* before you started GLEANINGS, and then took that when you first started it, and have taken it much of the time since. I got one of the first extractors you sent out, and I have it yet, but do not use it. I sold you quite a lot of bees by the pound one year in the 70's, and some queens too I think. I contemplate going down to Florida next fall and buy little place, and go every winter as you do. This winter is pretty hard here in Northern Michigan. The snow is over two feet deep, and keeps blowing in the roads so the track is built up three to four feet high.

Freesoil, Mich., Feb. 23. L. D. ALLEN.

I heartily agree with friend Allen, and find scorched ground or crushed wheat more wholesome and more delicious than any breakfast food or cereal on the market. After the wheat grains are steamed or boiled a little, only a little force is required to crush them, so they will be about the same thing as the Pettijohn rolled wheat in the market. Will our folks in Medina let us know how cheaply such a pair of metal rolls can be gotten up?

High-pressure Gardening

By A. I. ROOT

HIGH-PRESSURE GARDENING, ETC., IN FLORIDA IN MARCH.

With the good prices during the past winter, celery has been the great money-making crop, and, indeed, I might say during the past two winters. The celery industry has been crowding more and more into this part of the State, for two reasons—first, the frosts that we have are lighter because we are so far south, and also because of our nearness to the warm waters of the Gulf; secondly, because of the wonderful flow of artesian water in almost every part of Manatee County. Now, when I tell you what is being done here do not imagine every one can do it. Almost all the time I get letters asking if the writer can come here and make a living; and quite a few ask if it is *true* that a man can *get rich* on ten acres, etc. Any one of fair ability should be able to make a living here; and there are a few who really do get to be fairly well off on ten acres or less. My neighbor Rood is, or perhaps was, an educated lawyer; but he likes gardening and bees so well he has given up his office in town and become a farmer. Well, *Mr. Rood* seems to make every thing pay that he touches. When he got the celery fever a year ago I cautioned him about dropping (or at least partly) his strawberry and lettuce that were paying so well, and venturing on something he had never tried. But this is what he did: He went all over this region, used his eyes and ears, and asked questions; read the books and papers, and finally made a success the very first time trying. He has *promised* to give GLEANINGS some figures in regard to what he has done and what it cost; but he is such an exceedingly busy man I fear he won't get around to it. On his best ground the crop sold for something like at the rate of $1350 per acre.

A hive of bees on the scales gathered last Sunday, March 20, 9¼ lbs. of orange-blossom honey, and this one hive has stored already over 100 lbs. of this beautiful white honey, almost if not quite equal in looks and taste to any honey anywhere. Now, if I should give the above, and nothing more, very likely a great lot of you would "swarm" down here with your bees. The truth is, this is one of his best colonies, built up three stories high. Another truth is, this is almost the first good flow of orange honey for about three years, and the yield is probably confined mostly to localities below the dangerous frost-line.

Even in this county you see deserted orange-groves, gardens, etc., where a lot of money has at some time been expended and then given up. A few days ago I said to Mr. Rood:

"Why doesn't this man go around among his neighbors and see *how* they do things instead of trying to farm and grow the same crops he did up north?"

He replied: "Well, I declare, I don't know. He just stays right here at home, and doesn't go anywhere or see any thing. His land is just about as good as mine, but he hasn't yet even ditched it to get the water off."

I have spoken several times of our mulberries. Two years ago they were little trees perhaps a yard high. Now they are great spreading trees as large as apple-trees in the North, and are *loaded* with great luscious fruit. After breakfast and after dinner I devour them by the quart. They are so dead ripe that when a little breeze comes, they drop all over the ground; but there are more of them than 25 hungry Leghorn hens can take care of. They are so large you would say a common hen could never swallow one; but they manage to "make it," probably because they have practiced on oat-stalks 15 inches long. When a neighbor calls we invite him out to see the mulberries; and it's just fun to see each one utter exclamations of surprise at their size, abundance, and beauty, and, still more, when they taste one. We have now only six trees, but we are planting them in each one of our eight poultry-yards. If you want cuttings or

trees, write to Reasoner Brothers' Nursery, Oneco, Fla.

The first shipments of lettuce brought as good or better prices than heretofore; but toward spring there seemed to be a universal complaint about heading up properly. On this account neighbor Rood's lettuce-field has given my nearly 300 chickens (old and young) all the lettuce they could consume for about two months past. We wheel over to the chickens all that isn't fit for market.

FERTILIZING TRUCK LANDS IN FLORIDA.

On p. 240, April 1, are some statements in regard to the cost of fertilizing our Florida lands that may give a wrong impression. I have just been looking at some potatoes on neighbor Rood's land that surpass any thing I ever saw in Ohio or Michigan either. When asked how much fertilizer he applied per acre he answered something like this: "Mr. Root, I did not put any fertilizer at all on these potatoes; but I did give the ground a very heavy application when in celery, just before these potatoes. Let me explain. As I considered this one of the poorest spots on my place (and *new ground*), I gave it the heaviest application I have ever made on *any* piece of ground. I suppose we put on something like *four tons* to the acre (where you see these best potatoes) of a fertilizer costing $40.00 per ton. The celery crop alone sold for over $800 per acre."

These potatoes were larger foliage, heavier stalks, and better color than I think I ever saw before. Let me explain, that down here there are no Colorado beetles, no *flea* beetles, and no insects of any kind to puncture and perforate and disfigure the handsome potato-plant, for it *is* handsome where permitted to grow free and natural. As they were just coming into bloom, no one can tell as yet what the crop will be; but Mr. Rood dug into a hill and found fair-sized potatoes as clean and smooth as new-laid eggs. Notwithstanding that potatoes may be grown here almost all the year round, nearly everybody uses potatoes from the North. Other crops pay so much better, we can't afford to grow our own potatoes, even if poor ones shipped in *do* cost *fifty cents a peck*. Our home-grown ones are equal in quality to any I ever tasted in Ohio, Michigan, or Bermuda.

Poultry Department

By A. I. ROOT

POULTRY SECRETS, ETC.

A subscriber sends us the following advertisement, and asks us to investigate:

SURE DEATH TO CHICKEN LICE AND MITES GUARANTEED AT SMALL COST.

We have discovered a cheap and absolutely sure method of thoroughly exterminating chicken lice and mites from poultry-houses. This method has been thoroughly tested with uniform success, and we now offer to make it known for one dollar.

Remember, by our method chicken lice and mites will be entirely destroyed—eradicated—in a few hours at slight cost if our very simple instructions are followed. We are so sure of this, that, in the event of failure to destroy the vermin completely, we will promptly return the money received.

Only $1.00 for this knowledge, which will enable you to get your poultry-houses free from hen lice and mites if you should be so unfortunate as to have either of these pests upon your premises. Rid yourself of them by sending $1.00 to

CLOVER HILL FARM, Little Silver, N. J.

A dollar should pay for a good-sized book covering the *whole subject* of chicken lice and mites; but as I seem to be in the "business" I sent the dollar. In due time I received directions (that might be printed on a postal card) for fumigating the poultry-house with hydro-cyanric-acid gas, a method that has been in use for years for killing all insect life in greenhouses. It has been described again and again in our agricultural press, and, so far as I recollect, Mr. Lovett's directions are almost word for word like that of a government bulletin sent out a few years ago. It is also used under a tent for killing insects on orange and other trees. All Mr. Lovett has invented or discovered is using it for *poultry-houses* instead of greenhouses. Of course, the chickens must all be driven out; but will old poultrymen please tell me how much would be gained by cleansing the *house* if you let a flock of infested fowls come right in, people all the cracks and crevices once more just as soon as this volatile gas is out of the way? Zenoleum, carbonoleum, and all lice-killers sold penetrate the wood and keep out vermin for months or years afteward. But *that* isn't all. Before you can use this "dollar secret" you must make all your poultry-buildings absolutely *air-tight*. How much do you suppose it would cost *me* to make my six Florida (wire netting) houses so they would hold this gas made from sulphuric acid and cyanide of potassium?

This whole thing is a pretty fair sample of the average "poultry secrets" advertised for a dollar or more. I hardly believe a poultryman with the reputation Mr. Lovett has would be led to go into such a thing were it not that so many others have been "setting the pace."

One thing more: The Cyphers people and other dealers have for years advertised sulphur candles for fumigating and destroying all insect life in poultry-houses. Why should Lovett or any one else want to use this very dangerous and expensive gas, comparatively, when cheap common sulphur does the business perfectly? Is it not about time for the Department at Washington to forbid the use of the mails to such chaps?

BACK TO MEDINA, OHIO.

We are now planning to leave Bradentown, Fla., for Medina, on April 19. Will our many kind friends take notice, and direct all missives for myself to Ohio, after they see this? A. I. R.